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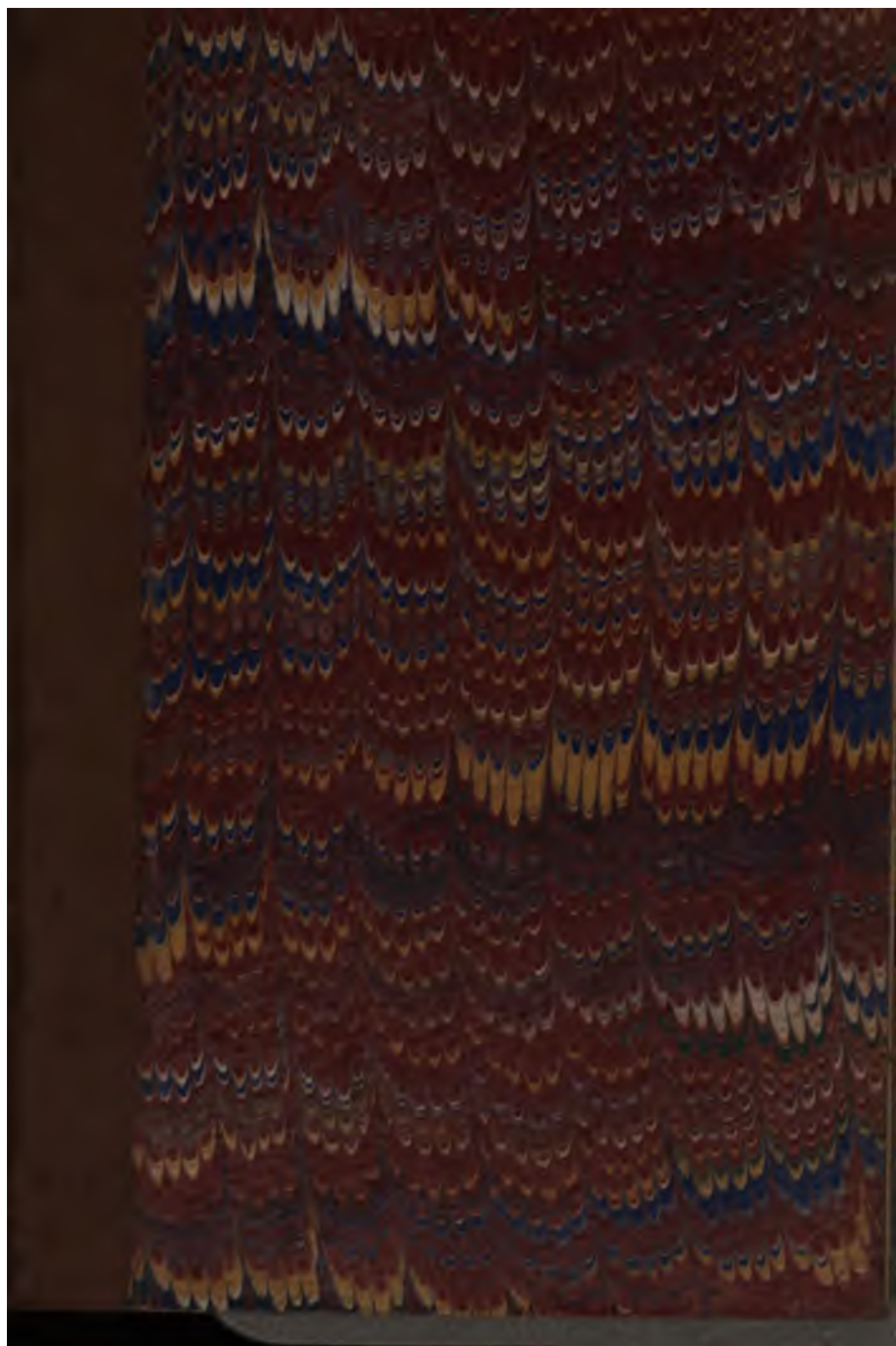
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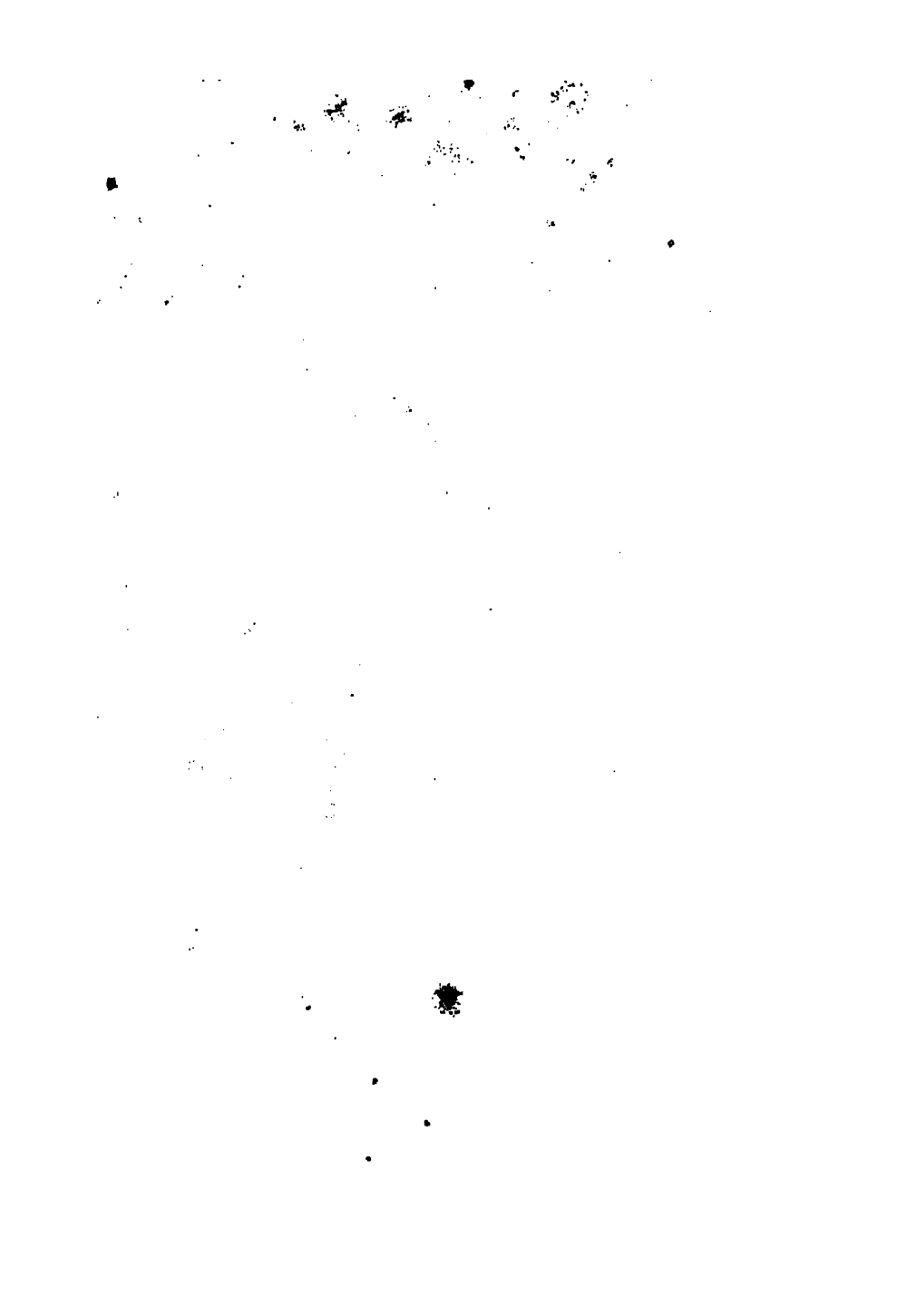




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PATENTS FOR INVENTIONS.

ABRIDGMENTS

OF

Specifications

RELATING TO

SAFES, STRONG ROOMS, TILLS, AND
SIMILAR DEPOSITORIES.

A.D. 1801-1866.

PRINTED BY ORDER OF THE COMMISSIONERS OF PATENTS.



LONDON:

PRINTED BY GEORGE E. ~~HYRE~~ AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.

PUBLISHED AT THE
OFFICE OF THE COMMISSIONERS OF PATENTS FOR INVENTIONS,
25, SOUTHAMPTON BUILDINGS, HOLBORN.

1873.

176. i. 68.



P R E F A C E.

THE Indexes to Patents are now so numerous and costly as to render their purchase inconvenient to a large number of inventors and others, to whom they have become indispensable.

To obviate this difficulty, short abstracts or abridgments of the Specifications of Patents under each head of Invention have been prepared for publication separately, and so arranged as to form at once a Chronological, Alphabetical, Subject-matter, and Reference Index to the class to which they relate. As these publications do not supersede the necessity for consulting the Specifications, the prices at which the printed copies of the latter are sold have been added.

The number of Specifications from the earliest period to the end of the year 1866, amounts to 59,222. A large proportion of the Specifications enrolled under the old law, previous to 1852, embraces several distinct inventions, and many of those filed under the new law of 1852 indicate various applications of the single invention to which the Patent is limited. Considering, therefore, the large number of inventions and applications of inventions to be separately dealt with, it cannot be doubted that several properly belonging to the group which forms the subject of this volume have been overlooked. In the progress of the whole work such omissions will, from time to time, become apparent, and be supplied in future editions.

This volume contains Abridgments of Specifications to the end of the year 1866. From that date the Abridgments will be found in chronological order in the "Chronological and Descriptive Index" (*see* List of Works at the

end of this book). It is intended, however, to publish these Abridgments in classes as soon as the Abridgments of all the Specifications from the earliest period to the end of 1866 have appeared in a classified form. Until that takes place, the reader (by the aid of the Subject-matter Index for each year) can continue his examination of the Abridgments relating to the subject of his search in the Chronological and Descriptive Index.

The present series of Abridgments contains the inventions relating to the construction of safes, strong rooms, tills, and similar depositories, window safes, key and other strong boxes, including the casting of safe bodies and doors in chills, preparing the moulds, and combining wrought and cast iron in the manufacture. It likewise embraces the various contrivances which have been devised to render the doors and bodies of safes and the doors of strong rooms burglar-proof, and also the several fire-resisting compounds, and non or slow heat-conducting substances employed to fill the circumvesting cavities which are formed in the walls and doors of safes and strong rooms. Electrical and other signal and alarm apparatus, and all the other contrivances invented for the protection of safes are contained in this volume; but (with few exceptions) the series does not include the locks and lock-bolts, which will severally be found described in the series of Abridgments entitled "Locks, Latches, Bolts, and Similar Fastenings." The manufacture and preparation of angle and other iron, iron and steel plates, and plates of both metals combined, and the welding, uniting, case-hardening, and tempering of wrought metals, when specially claimed for the manufacture of safes, &c., are included in this series.

B. WOODCROFT.

December 1873.

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[The name printed in *Italics* is that of the person by whom the invention has been communicated to the Applicant for Letters Patent.]

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INTRODUCTION.

IN order to introduce the reader to the subject of this volume, it is not necessary that the pages of history be turned back far into the past. Our forefathers, simple in their arrangements and requirements, were satisfied to place, and deemed their valuables safe either in an oak chest secured by one or two locks in front, or in a brick or stone closet, to which was fitted either a plain sheet iron door studded with nails or checkered with hoop iron rivetted through, and guarded by a lock more or less warded, or a padlock applied by means of hasps and staples.

An interesting specimen of an old oak chest, is the celebrated chest wherein the crown jewels of Scotland were deposited in the year 1707. The lid of this chest was secured by three locks, severally forced open in the year 1818, in the presence of the Royal Commissioners, because, as the account of their proceedings states, "no keys could anywhere be found." This incident seems to prove that neither the locksmith nor the mechanic of those days were known experts at lock-picking, and that the art was believed to be practised only by thieves, otherwise this relic of olden times might have been saved from such profane violence simply by the use of a bent skewer, which would in all probability have opened the locks without much difficulty.

Many of these oak chests are still to be found in perfect preservation, covered more or less with fine ornamental carving, and much valued as relics of former times; they were comparatively thought by their owners to be as secure as we regard the modern thief-proof safe.

The first examples of the manufacture of metal safes or chests are to be met with in the foreign coffers, the iron frames of which were covered in with sheet iron, strengthened by hoop iron crossed at right angles on the outside and rivetted through. Some of the bodies of these coffers were elaborately ornamented, especially *about the escutcheon* or parts surrounding the keyhole, and the

embellishments at the back of the metal lock case inside the lid were frequently most skilfully and artistically wrought.

Respecting a specimen, known at Paris in the last and beginning of the present century as the strong German coffer, "Réaumur" says "nothing is wanting in these coffers on the score of "solidity; they are made entirely of iron, or if of wood they are "banded both within and without with iron, and can only be "broken open by very great violence. Their locks are almost as "large as the top of the coffer, and close with a great number of "bolts."

Several smaller specimens of foreign coffers, supposed to have been made in the 17th century by French manufacturers, are deposited in the South Kensington Museum; there is also one in the Patent Office Museum, and another fine specimen may be seen in Edinburgh, at the bank of Scotland. These coffers were undoubtedly a great improvement on the oak chests of former times, and their use manifestly occupied the interval of years which elapsed between the oak or wooden iron-bound chest, and the first iron-made fire-resisting and burglar-proof safes of modern times.

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charred (charcoal) or in its natural state, and steeped or soaked in a solution of alkaline salt; that the lid or door was constructed in the same manner as the body of the chest with an inner lining having the interspace filled with the same saturated material; the door was hung to turn on pivots at the ends, and secured by either a padlock or "by a lock of the kind usually put to iron chests." Another ingenious devise consisted in the mode which he adopted for insulating the inner receptacle by supporting it on the points of metal pins, in a manner to preserve a surrounding space uniform on all sides between it and the inner casing or lining, so that the chances of heat reaching it by metallic conduction were reduced as much as possible to a minimum. It seldom happens that the true mark is so fairly scored by the first patentee, who in this instance left a good practical lesson to future safe makers.

These iron chests, lined and fitted in accordance with the foregoing description, came soon after the date of the patent gradually into use as depositories for books of account, documents, bank notes, and other valuable property; they were (cupboard fashion); either mounted on piers of brick or other infusible material, or built into walls, and were generally considered secure against the efforts of the burglar.

The second Letters Patent for fire-resisting safes and depositories were granted in the year 1834 to William Marr. This inventor introduces into safes a second metallic lining, disposed on all sides so far within the original lining as to form a second surrounding cavity which he lines with laminated mica or talc, and fills the interspace with substances known to be non or slow conductors of heat. He also lines the inner lining of safes with slabs of dried clay, which in a plastic state has been mixed with pulverized pumice-stone or charcoal.

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It is difficult to fix with any degree of certainty the time when the construction of either wrought or cast-iron safes commenced in this country; it was certainly not many years before the advent of the present century, or if otherwise, the limited number of persons to whom alone their possession and use were confined must have been few.

[The invention of fire-resisting iron safes belongs to modern times, and burglar-proof safes to even a later period. The first grant of Letters Patent for a fire-resisting safe was made A.D. 1801, to Richard Scott, who seems to have comprehended the true elementary principles required to be brought into combination in the construction of fire-resisting safes, and to whom the merit of having laid the rudimental foundation whereon the best fire-resisting safes have subsequently been constructed is without doubt fairly due, for according to the specified description of his invention we find, that the outside case of his "iron chest" was constructed of metallic plates, of iron or other metal, or a mixture of metals, welded or united at the corners; that it had an internal lining or casing of metal which formed a surrounding interspace or cavity on all sides, which cavity was filled with wood, either

charred (charcoal) or in its natural state, and steeped or soaked in a solution of alkaline salt; that the lid or door was constructed in the same manner as the body of the chest with an inner lining having the interspace filled with the same saturated material; the door was hung to turn on pivots at the ends, and secured by either a padlock or "by a lock of the kind usually put to iron chests." Another ingenious devise consisted in the mode which he adopted for insulating the inner receptacle by supporting it on the points of metal pins, in a manner to preserve a surrounding space uniform on all sides between it and the inner casing or lining, so that the chances of heat reaching it by metallic conduction were reduced as much as possible to a minimum. It seldom happens that the true mark is so fairly scored by the first patentee, who in this instance left a good practical lesson to future safe makers.

These iron chests, lined and fitted in accordance with the foregoing description, came soon after the date of the patent gradually into use as depositories for books of account, documents, bank notes, and other valuable property; they were (cupboard fashion) either mounted on piers of brick or other infusible material, or built into walls, and were generally considered secure against the efforts of the burglar.

The second Letters Patent for fire-resisting safes and depositories were granted in the year 1834 to William Marr. This inventor introduces into safes a second metallic lining, disposed on all sides so far within the original lining as to form a second surrounding cavity which he lines with laminated mica or talc, and fills the interspace with substances known to be non or slow conductors of heat. He also lines the inner lining of safes with slabs of dried clay, which in a plastic state has been mixed with pulverized pumice-stone or charcoal.

The next patentee in order of date, A.D. 1835, was Charles Chubb, who to counteract the boring bits and tools of thieves, lined wooden chests with thin metallic plates of case-hardened iron or tempered steel; he also, for the purpose of rendering iron safes and boxes fire-proof, employed additional lining plates to form a succession or series of spaces one within another, all of which were filled with non or slow heat-conducting substances.

In the year 1839 a grant of Letters Patent on this subject was made to Charles and Jeremiah Chubb, who in their efforts to preserve from the destructive effects of fire, books, papers, and other

articles deposited in safes, conceived the idea of a well or sunken chamber constructed in or below the basement of the building, in which sunken chamber, after the business of each day, the safe and its contents, by means of suitable mechanical contrivances, was to be lowered, and raised therefrom on the following business morning.

In the year following, viz. 1840, was issued the grant of Letters Patent to Thomas Milner, whose invention consisted in filling the cavities in the walls of safes with absorbent substances, such as sawdust, amongst which were distributed small sealed vessels containing an alkaline solution. In case of a fire happening contiguous to or surrounding a safe, so soon as the heat reached the vessels it would cause them to burst and their contents to run out and saturate the sawdust or material, and thereby render it for a considerable time indestructible by fire. This invention was highly esteemed at the time, and although embodying the principle first conceived by Scott, it was undoubtedly another step in advance.

The next grant of Letters Patent was, A.D. 1843, made to Messrs. Tann, whose invention, although based upon the same principle, reached the desired result more perfectly and by simpler means. Their fire-resisting medium was a compound, consisting (by preference) of ground alum and either Austin's cement or gypsum finely powdered. The alum mixed in equal proportions with either of the two latter substances was, after being heated to liquefaction and cooled, broken or pounded into particles, and in this state was rammed into the surrounding cavities of safes respectively formed between two linings, one of wood inside one of metal. When (in the case of a fire) heat reached the fire-resisting compound, it emitted a moist vapour which permeated through the crevices of the linings and amongst the contents of the safe, and by moistening them prevented their destruction.

In the year 1851 William Milner obtained Letters Patent for an invention relating to safe fastenings, and to a mode of coating the inside of the outer casing or shell of a safe with an infusible cement, composed of powdered quartz and hard wood dust, applied in a plastic state and dried; this was applied as a non-conductor, and was intended to obstruct the passage of heat.

The last patent we shall notice in connection with fire-resisting safes was in the year 1855 granted to George Price, whose inven-

tion amongst other things more particularly relating to the constructional details of safes, was intended to counteract or prevent the corrosive action on the surface of the metal linings and metallic fittings of safes, caused by the humid exudation emitted by the saline constituent of the fire-resisting composition contained in the chambers and cavities of the walls.

The next important element in the construction of safes consisted in making them thief-proof. The modern safemaker was driven by actual necessity to devise means which should counteract and frustrate the skilful efforts of the modern burglar, and to produce a safe so perfect in all the elements of safety, that if left unprotected for hours in the hands of accomplished thieves, armed with the most perfect weapons skill and science could contrive, it must withstand all their attacks (which happily for fear of detection must be made in silence), and remain invulnerable. To this end the best efforts of modern safemakers have been chiefly directed, hence the list of patents in the following pages for inventions mainly relating to the manufacture and preparation of metallic plates composed of iron combined with hardened steel in various ways and by various processes, lining plates of tempered steel, casting safes in chills, case-hardening, tempering, and a variety of ingenious devices, contrived for the same object, viz., to circumvent and defeat the burglar, and to which inventions severally in chronological order the subject-matter index will direct the reader.

“Cast-iron chests have been made for many years at Coalbrookdale, Birmingham, Wolverhampton, and at some other places, and have been exported to all parts of the world; but wrought-iron ones were first made in London, and the trade was confined to the metropolis until within the last twenty years, when several locksmiths in the vicinity of Wolverhampton, and some mechanics at Sedgley and West Bromwich, in the county of Stafford, commenced making them, and the late Thomas Milner, a tinner at Sheffield, who removed to Manchester about the year 1827, where he carried on a similar business for three years, afterwards settled in Liverpool, and there commenced the manufacture of tin-plate and sheet-iron boxes, and subsequently strong plate-iron safes and chests.” *

* Price's Treatise on Fire and Thief-proof Depositories.

Many safes have, by way of showing their fire-resisting qualities, been subjected to a fiery ordeal by their makers, and other safes to prove their invincibility, have been placed in the hands of skilled artisans, to whom, if they succeeded in opening such safes, a premium was to be rewarded. These severe trials kept alive an interest in the subject on the part of the public, and were regarded as an exhibition of great confidence and faith in the enduring qualities of their safes on the part of the makers, to whom the destruction of the safe would be nothing as compared with the loss of reputation in the event of a failure.

Another important desideratum in the construction of safes has been, so to fill up all the cavities in the locks and lock cases, and contiguous parts of the door, that no space be left available for the lodgment of gunpowder, by the explosion of which thieves have succeeded in so far shattering and weakening the fastenings as to obtain access.

According to the published statement of an eminent safe manufacturer, every perfect safe, that is, a safe capable of resisting for hours the effects of fierce fire heat, even if surrounded by fire and its outer case made completely red hot, and also of standing firm and unyielding against the most determined attacks of clever thieves, made either with drills, cutters, levers, gunpowder or other explosive substances, must possess the following essential and intrinsic defensive properties, viz. :—

First. The outer case or shell must be sufficiently thick to withstand all violent attempts to break it open, also to remain intact if it falls from any height such as the upper story of a lofty building, or has falling materials thrown upon it, and the parts must be so welded or conjoined, that even extreme violence shall not be able to separate them.

Second. The door must be so carefully fitted to close, that no direct passage or crevice is left for the insertion of a wedge, chisel; or other instrument, and the material of the metallic plates, whether the outer case be made of iron or steel or both materials combined, must be so case-hardened or tempered and carefully prepared, that no drills or cutting instruments can perforate it for the purpose of either reaching the works of the small lock, or introducing gunpowder.

Third. The ends of rivets, studs, or pivots employed to fix the lock case, door frame, or any of the internal fittings, must not on *any account be permitted to appear on the outside.*

Fourth. The large lock bolts must be of good material, well made, easy in motion, and not liable to derangement, so that when once inclosed, future access to them may never be required; they should be so connected to the knob spindle as to be capable of being easily thrown by hand, and they should slide in channels, in order that no space or cavity be left available for gunpowder, in the event of any burglar having even succeeded in piercing the case or door. The bolts with two, three, or more heads, should shoot from both sides of the door, and in the construction of large safes, from the top and bottom also.

Fifth. The lock case and lining, which incloses the fire-resisting composition and is attached to the inside of the door, must be accurately made to fit when the door is closed, so that no opening or crevice exists through which the preserving medium or vapour can escape.

Sixth. The inside lining or linings which forms or form chambers to contain the fire-resisting material, should be carefully fitted to the outer body or casing, in order to prevent any undue escape of the vapour. Solder which would melt must on no account be employed.

Seventh. The corrosion of the internal surfaces of the outer casing and lining, and those parts with which the fire-resisting composition comes in contact, must be prevented by coating such surfaces with a mixture of red and white lead and oil, or with other substances which when dried are impermeable to damp or moisture, and the vapour when generated must not injure the contents of the safe. The thickness through of the mass of the fire-resisting substance may be from two to six inches, varying in relation to the probable duration of a fire causing the destruction of the building wherein it is placed, and in deciding this point, the height and the nature of the materials composing and surrounding the premises wherein the safe is deposited must be taken into consideration.

Eighth. The small lock which secures the main lock bolts should be of approved construction, easy to use, and not liable to derangement; its frictional details should be case-hardened or be made of tempered steel to prevent wear; it should be gunpowder proof, and above all a lock that it is not by any means possible to pick. The key should be so sufficiently small as to be capable of being carried on the pocket bunch, or in the waistcoat pocket *without inconvenience*.

SAFES, STRONG ROOMS, TILLS, AND SIMILAR DEPOSITORIES.

A.D. 1801, February 10.—N° 2477.

SCOTT, RICHARD.— This invention of a fire-resisting safety chest adapted to the preservation of papers and other property, “ consists of a box or chest ; the dimensions may be various ; the “ outside of the box to be of iron, or any other metal or mixture “ of metals, to be formed into an oblong or square and the “ corners of the plates welded or united, so as to exclude as much “ as possible the air ; this outside metal case to be lined with “ wood, either in its proper state, as oak or other plank, or the “ same char’d, and afterwards steeped or soaked in a preparation “ of alkaline salt dissolved in water ; the outer case to be of plate. “ the strength according to the size of the box, the lining of “ wood, to be in the same proportion ; an inner lining to enclose “ the wood, of iron or other metal, close welded or jointed, and to “ confine and unite the outside box with the wood or char’d “ lining into one close and solid box, with a lid to turn upon “ points or pivots at each end, or other hinges, and the lid constructed in the same manner as the other parts of the box. “ This box is to contain a second or inner box, to be inclosed in “ the outer, and to stand upon pins or points of metal at the “ corners, so as to keep the two boxes apart from each other, and “ at distances in proportion to the size, supported by the feet, “ points, or pins at every corner or side, so as to keep the two “ boxes at an equal distance from each other on all sides ; the “ outer box may be locked by an external or padlock, or by a “ lock of the kind usually put to iron chests.”

[Printed, 4d. No Drawings.]

A.D. 1828, December, 18.—N° 5746.

DRAKE, FRANCIS HORATIO NELSON.—(*A communication.*)
—“Process for the invention of a particular till.”

[No Specification enrolled.]

A.D. 1834, February 13.—N° 6555.

MARR, WILLIAM.— This invention relates to the construction of safes, boxes, and other depositories, designed for the protection of paper and other documents and property from the effects of fire. It is intended as an additional security to such metallic safes as are constructed with cavity walls or sides, that is, an outer and an inner case forming between them a thin open space to contain air, the door also being constructed in the same manner.

To such safes the inventor adds an additional double lining which is attached to the inner case and also to the inside of the door. This second lining is formed with metal plates set apart so as to leave between them a narrow cavity, by which the interior of the safe is completely inclosed. This cavity has both sides lined with laminated mica or talk, split into thin scales or sheets gummed together on a foundation of thin paper, the narrow space or cavity between being completely filled with any granulated substances being non or slow conductors of heat, such as burnt clay and charcoal, a variety of animal, vegetable, and mineral substances being also named as possessing the requisite qualities, and equally applicable for the purpose.

Metallic safes constructed with air cavities between the inner and outer casings, may be lined with slabs or plates of clay, mixed with pumice stone or charcoal dust whilst in a plastic state, and then dried and slightly burned. Roman cement may be used for the purpose.

[Printed, 6d. Drawing. See London Journal (*Newton's*), vol. 14 (*conjoined series*), p. 121.]

A.D. 1835, May 13.—N° 6832.

CHUBB, CHARLES.— This invention relates to the construction of safes, boxes, and similar depositories, the object being to render such receptacles, as are made of wood and otherwise, proof against the boring, drilling, and other tools of thieves and burglars; and such as are made of metal, proof against the effect of fire.

To this end, wooden safes and boxes are lined with case hardened iron or tempered steel plates, the metal in either case being cut to the required form and size, fitted to their places, and the holes for the fixing screws or pins drilled previous to the case hardening or tempering process.

The process adopted for case hardening the prepared iron plates, consists in placing the plates separately in a metal box, each plate being kept apart from the rest by an interlayer of granulated animal charcoal. When the lid of the box is secured it may be luted with fire-clay, and the box is then placed in a suitable furnace and heated to a strong red heat, which is kept up at a uniform temperature for the space of ten or twelve hours before the box is withdrawn. Whilst at a red heat the plates are taken out separately and immediately plunged into a bath of either cold water or of oil or tallow. The steel plates are uniformly heated to a red heat in a furnace, and immediately plunged into a similar bath.

Iron safes and boxes are rendered fire proof by several successive linings or layers of sheet metal, so fitted one inside another, as to leave narrow interspaces, which are filled with granulated burnt brick, pottery, and other similar non or slow heat conducting substances rammed into paper receptacles, which during the filling process are supported in moulds.

The remainder of the invention relates to the construction of and mode of securing, fitting, and applying the locks, bolts, and fastenings employed, the nature of which will be found more particularly described in the volume of Abridgments devoted to that class of inventions.

[Printed, 1s. 6d. Drawings. See London Journal (*Newton's*), vol. 17 (*continued series*), p. 25; *Engineers' and Mechanics' Encyclopaedia*, vol. 2, p. 107.]

A.D. 1839, June 11.—N^o 8100.

CHUBB, CHARLES, and CHUBB, JEREMIAH.—An invention which relates to fire-proof wells and sunken chambers, and to mechanical appliances to be employed for raising and lowering chests, safes, and boxes, containing books, papers, and valuable documents, from and into such wells and chambers, which in order to be fire-proof have walls of brick or stone that for the purposes of security may be lined with iron. The chest or safe is placed upon a platform, which is suspended by four chains, one at

each corner, that pass over pulleys furnished with teeth which engage with the links of the chains and prevent slipping, the pulleys being caused to rotate at a uniform speed by worms fixed on the ends of a cross shaft, working in worm-wheels mounted, one on each of the pulley-shafts. To the upper ends of the chains are affixed counter-balance weights which descend when the platform with the safe rises, and vice versa when it goes down. By this means the labour of raising the platform and chest is reduced to a minimum. The cross-shaft is actuated by a pair of mitre-wheels, one being fixed on the cross-shaft, and the other on a small vertical shaft which passes centrally up through an upright pedestal fixed upon the strong iron plates which surround the chamber or well, and within which the cover which rises and falls with the chest or safe is fitted, and when down may be secured by locking or otherwise, the handle which gives motion by means of bevel-wheels to the vertical shaft, being removable, and therefore an additional source of security.

[Printed, 1s. 4d. Drawings.]

A.D. 1840, February 26.—N° 8401.

MILNER, THOMAS.—This invention relating to the construction of fire-resisting iron safes, boxes, and other depositories adapted to the preservation of papers and other property, consists in forming between the outer case or body of the safe and of the door or cover, by means of one or more inner linings or casings, a space or spaces on every side, and filling up such spaces with any absorbent material, such as porous wood, dust of wood, bones, or other substances, amongst which are distributed pipes, tubes, or other small closed vessels containing any alkaline solution or other liquid that may be rendered vapourable by the agency of heat. Whenever the safe or depository is exposed to such action, it bursts or fractures the vessels, and causes the liquid to flow out and saturate the absorbent material employed to fill up the interspaces. Thus moistened the material is not easily destroyed, and will act as a protector to the contents of a safe so inclosed. The same absorbent material may be used as a protecting medium to line strong-rooms, closets, partitions or pigeon-holes used for depositing office-papers, the backs of books, and as an anti-combustant generally for various other purposes.

[Printed, 6d. Drawing.]

A.D. 1843, November 25.—N° 9963.

TANN, EDWARD, senior, TANN, EDWARD, junior, and TANN, JOHN.—This invention relates to the construction of fire-resisting safes, chests, strong-rooms, and other repositories designed for the preservation of papers, books, and documents; also to locks and latches of security applicable to safes and repositories, and consists in:—

1st. Inclosing a safe within an outer case of equal strength in such manner that a narrow space or cavity is formed between them.

2nd. Filling the cavity between the inner safe and outer casing with a chemical and mineral combination of non or slow heat-conducting substances, consisting of equal quantities of finely-ground alum, and either Austin's cement or gypsum finely sifted. These substances are thoroughly amalgamated by heating to liquefaction and ebullition in an iron vessel, being well stirred during the process; afterwards the combined product is poured upon a flat tray or surface to solidify and cool, and when cold is broken up and pounded into particles. With the material thus prepared, the cavity is completely filled, so as to form when rammed or pressed in, a compact mass, which entirely circumvests the inner safe.

3rd. Lining the inner case or body of the safe or repository with wood so as to form between such wood lining and the internal surface of the inner body another cavity, which is also to be completely filled with the same combined substances, as well as other thin spaces which are to be formed by double partitions of wood, that are intended to subdivide the interior.

4th. Relates to the outer and inner doors of safes and strong rooms, which are to have cavities formed in the same manner, and filled with the same material, additional security against improper attempts to force open the safe, being obtained by a projection attached to the hinged side of the door entering a socket when the door is closed.

5th. Describes the effects of the action of heat upon the combined non-heat-conducting substances; and

6th. Relates to the locks and latches employed as fastenings, and which will be found more particularly described in the series of Abridgments, entitled "Locks, Latches, Bolts, and similar Fastenings."

A disclaimer and memo. of alteration is appended to the specification of this invention.

[Printed, 2s. Drawings.]

A.D. 1851, March 3.—N^o 13,540.

MILNER, WILLIAM.—The object of this invention relating to the construction of safes, boxes, &c. is to render such depositories more completely fire-proof; it also relates to the bolts and fastenings employed which are particularly described in the series of Abridgments relating to "Locks, Latches, Bolts, and similar Fastenings."

The invention is in part supplementary to prior Letters Patent, granted February 26, 1840, N^o 8401, to Thomas Milner for an invention relating to safes, &c., according to which they were constructed with inner chambers, and the interspaces between such chambers were filled with any material capable of evolving moisture when exposed to the action of intense heat. The present invention provides an internal coating of plastic cement, which is to be spread over the inner surface of the main or outer case. The materials of which this cement is composed, consist principally of powdered quartz or other infusible substance with an admixture of a small quantity of hard wood dust. The cement is to be laid on by suitable means in a damp plastic state, and subsequently dried.

[Printed, 10d. Drawing. See *Mechanics' Magazine*, vol. 55, p. 218; *Patent Journal*, vol. 2, p. 291.]

PATENT LAW AMENDMENT ACT, 1852.

1852.

A.D. 1852, October 1.—N^o 136.

NIXEY, WILLIAM GEORGE.—This is an invention of apparatus adapted to tills and receptacles for monies received, and is

designed for the purpose of keeping in separate compartments for a limited time, the latest sums in the order in which they have been previously taken.

The apparatus consists of a flat circular box, the round top or plate of which is composed of strong transparent glass. Interiorly it contains a revolving receiver, segmentally divided into compartments by partitions radiating from the axial centre on which it turns. As the successive sums of money are received, they are by turns dropped through an opening in the glass cover into one of the segmental divisions of the receiver, which by means of a lever handle is then moved round equal to the space of a segmental division, and is there held by a pawl and ratchet, so that it cannot be turned back by the backward motion of the handle, which is caused by the reaction of an india-rubber or other spring, when the receiver is moved round a division after each fresh deposit. In this way the latest sums received may be seen and kept apart in the separate compartments of the receiver until by the successive movements of the receiver they are brought over an opening in the bottom of the box, through which by turns as the different sums come round they fall into the till beneath, the emptied compartments in succession by the next move coming under the opening in the glass cover.

[Printed, 8d. Drawing.]

A.D. 1852, October 28.—N^o 557.

MALLET, ROBERT.—This invention relates to the employment of a particular form of wrought iron or “buckled” plate, adapted for metallic buildings, bridges, and a variety of structural purposes, and also to the employment of such plates in the construction of safes, boxes, and similar depositories.

These plates, either by hammering or otherwise, are dished or made concave on one surface, and, as a consequence, convex on the other, the edges and margin all round remaining relatively level, so as to be capable of being bolted or rivetted together, or to the lower flanges of metal girders and angle iron frames; and when employed in the construction of safes and chests, they may either be rivetted to angle-iron to form the corners and angles, or they may have their margins turned up to an angle and rivetted together. When cast metal plates are used the moulds have the necessary configuration to give them the dished form, and instead

of rivetting, they are by preference to be fastened in their places by bolts. When employed in the construction of fire-proof buildings, they support a thick layer of concrete, or of bricks embedded in cement.

[Printed, 10d. Drawing.]

1853.

A.D. 1853, January 7.—N^o 50.

GITTINS, RICHARD.—This invention relating to the construction of tills, consists in the application thereto of an apparatus whereby the money previously received in succession from several of the latest customers, will remain in sight protected by a glass cover, the object being to prevent mistakes and show for a limited time subsequent to the receipt of sums of money the amount and nature of the coin paid.

The apparatus is applied to the counter or other cover of the till, and consists of a series of compartments into one or other of which respectively the several sums as they are received are deposited through a slit or opening at the back. The bottom of each compartment is capable of being tilted, but is kept closed notwithstanding the money it contains by a counter-balance weight until such time as it is tilted or inclined by the person behind the counter who, by giving to the bottom of the compartment the requisite inclination will cause the money to slide out and fall in the till or receptacle beneath, the money whilst remaining in either of the several compartments being, by reason of the transparent nature of the covering which protects it always open to inspection.

[Printed, 8d. Drawing.]

A.D. 1853, November 7.—N^o 2587.

NEWTON, ALFRED VINCENT.—(*A communication*)—The object of this invention is the application of improved means “for preventing the fraudulent abstraction of property,” from safes and strong rooms, vaults, &c., and relates also to their *construction*.

The locks bolts and fastenings employed to render such depositories secure will be found described in the vol. of Abridgments relating to "Locks, Latches, Bolts, and similar Fastenings."

The principle on which safes and strong-rooms and their doors are constructed according to this invention, consists during the casting process in combining wrought iron with iron cast in chills, the object being to have in combination the toughness of the wrought metal with the hardness of the chilled cast metal in order to render the combined mass not only capable of resisting blows or if fractured thereby it may not be liable to separation but also incapable of being perforated by drills. To this end the external mould is made of cast iron and of such a substance that the molten metal when run into it will become suddenly chilled and hardened. The inner mould or core which forms the interior of the safe is built up in the usual way and finished with a sand plaster coating and dried. Around this core, so as to pack in the space between the outer mould and over the inner core, is introduced a covering of net-work composed of wrought-iron rods, which must not touch, excepting for the purposes of support, either the internal surface of the outer mould or the core, in order that when the molten metal is run into the interspaces, the net-work may be completely inclosed, and form in combination with the cast metal a compact tough solid mass, so chilled and hardened externally as to be capable of effectually resisting the action of drills, chisels, and cutting implements. The nuts required to receive the bolts for affixing the locks and hinges, may be introduced in the mould in their proper position before the melted metal is run in.

[Printed, 1s. Drawings.]

1854.

A.D. 1854, July 5.—N° 1476.

SYMES, WILLIAM.—(*Provisional protection only.*)— This invention relating to the construction of tills is described by the inventor as follows:—

"My tills are divided into three compartments each of which
"has a hinged top. I place over the two compartments intended

“ for the reception of gold and silver a piece of glass or wirework,
 “ and connected to the underside of each top is a box, into which
 “ the coins fall, and remain visible until passed into the lower
 “ part of the till as hereafter explained.—“The bottom of this
 “ box is a slide or tray, which may be drawn out by a rod passing
 “ through the front of the till, when the cash will fall into a bowl
 “ placed in the bottom of the till. The slide may be made to
 “ resume its place by an india-rubber or other suitable spring. I
 “ propose to let my tills into the back of a counter and flush with
 “ the top and side. Space will be saved by no drawer having to
 “ be drawn out behind the counter in order to give change or to
 “ empty the till.”

[Printed, 4d. No Drawings.]

A.D. 1854, July 12.—N^o 1533.

GARDISSAL, CHARLES DURAND.—(*Provisional protection only.*)—An invention of a “ stamp safe ” designed for the safety of postage, receipt, and other stamps, labels, and similar articles of value or private use. This safe as described by the inventor “ consists of a box, case, or of a compartment of any piece of furniture; this box, case, &c., being suitably shaped, so as to “ receive any number of wooden, metallic, or other rollers or “ spindles, placed at the proper distance, and capable of turning “ in the box, &c.”

“ The box can be opened on one side, so as to allow easily of “ winding the different kinds of stamps on the different rollers.”

“ The opposite or other side has apertures, so as to allow “ drawing out the stamps as they are used; the said side being, “ for instance, made up of moveable longitudinal slips or panels, “ between which the different sheets of stamps are made to pass, “ and which may be made to have an elastic or resilient action, by “ means of a spring or similar contrivance.”

“ This side may also have suitable cutting apparatus affixed to “ it. The stamps that have been unwound, and are not used at “ the time, may be coiled back, either by turning the rollers, by “ means of knobs projecting outside the box, or else by means of “ a spiral spring, or equivalent contrivance, fixed on the spindles “ of the rollers.”

“ In order to prevent the uncoiling of the stamp whilst the “ rollers are stationary, I employ the frictional contact of a spring

“ or india-rubber band bearing against the circumference of the
“ coiled sheet. The feeding and delivering sides, above described,
“ have doors or lids, which can be locked with a key or other
“ locking apparatus, so as to preserve the stamps from being
“ interfered with.”

[Printed, 4d. No Drawings.]

A.D. 1854, December 20.—N° 2684.

MILNER, WILLIAM.—This invention relating to the construction of safes and safe locks, is supplementary to prior Letters Patent for improvements in locks (bearing date February 20, 1854, N° 405), and is designed to extend, first as regards safes, the principle of packing or filling up with wood or other suitable material, all the open space or spaces existing between the plates which form the lock-case, being the two outer plates of the door, exterior to the inner chamber of the door wherein is deposited the fire-resisting composition, so as to leave only just sufficient room between the two plates for the body of the lock, and working passages for the bolts, the object being to defeat all attempts made to introduce gunpowder or other explosive or deleterious substance, by filling up with solid material all the spaces previously available for its lodgment. The parts immediately inclosing the works of the locks are made solid with three laminated thicknesses of iron packing-plates, the middle packing-plate having a central opening to receive the lock-mechanism, and these plates are fastened together, and made one solid mass between and with the door-plates by six screw bolts which pass through holes in the inner door-plate and the packing-plates into tapped holes made from the inside partly through the outer plate of the door, so that their extreme ends do not show exteriorly. All the surrounding space between the door-plates is to be carefully filled up or packed with wood, metallic substances, baked earthenware, corkwood, &c., wood being preferred because of its spongy and elastic nature, which causes its fibres to close (if perforated with a tool suitable for boring iron) when the tool is withdrawn.

The second part of the invention, which relates to the filling up the space in and about the lock, the keyhole, and the limited action allowed for the operations of the key, is more particularly

described in the series of Abridgments which refers exclusively to
"Locks, Latches, Bolts, and similar Fastenings."

[Printed, 10d. Drawing.]

1855.

A.D. 1855, January 31.—N° 236.

PRICE, GEORGE.—The object of this invention relating to the construction of iron safes, chests, and boxes consists :—

1st. In counteracting or preventing the corrosive action on those internal surfaces of the double metal casings which form the body of a safe, that takes place when the interspace between the casings is filled with chemical substances, either alum or other salt, or with substances which are slow or imperfect conductors of heat. It is found that the corroding action of these salts and substances is very detrimental and weakening to the metal plates and parts which inclose them, and in order to prevent it as much as possible the internal surfaces are coated with, by preference, a composition of red or white lead mixed with linseed oil and a small quantity of turpentine. This composition may be laid on with a brush.

2nd. Subjecting the iron plates which are intended to form the external body or casing of the safe, to the process of case-hardening, the plates being, during the heating process, constantly in contact with substances capable of yielding carbon. These case-hardened plates being drill-proof renders the use of steel plates in the construction of safes unnecessary.

3rd. Introducing into the unoccupied space in the lock case and hollow parts of the doors, strips of iron bent in a reticulated or honeycomb form, thereby to prevent the introduction of gunpowder into those parts, excepting in such small quantities that, by their explosion, would not damage the locks or bolts.

[Printed, 6d. Drawing.]

A.D. 1855, August 21.—N° 1888.

LONGSDON, ROBERT.—This invention relates to a hydrostatic apparatus, designed for raising a receptacle made for containing

bankers and merchants' books, documents, and securities, out of strong rooms, vaults, and similar depositories, constructed in or below the basement, and lowering the said receptacle with the books and documents after the business of the day. Instead of the cranes and other contrivances usually employed, the effect is produced by means of the pressure of a column of water, held in pipes which form a connexion between a cistern or reservoir at the top of the building, and the end of a hollow metal cylinder sunk vertically below the floor of the strong room and containing a hydraulic ram, beneath which the static pressure of the column is directed by the opening of suitable stop-valves or cocks. The ram extends upwards through a cylindrical stuffing box, and supports the receptacle wherein is deposited on shelves forming separate compartments divided by partitions, the books and documents placed there for security; the top of the receptacle is formed by two iron plates placed apart, the interspace being filled with brick or other slow conductor of heat, and when lowered the marginal edges of this top or cover, sink into a rebate formed round each side of the iron coping which surrounds the mouth or entrance, through which the receptacle descends into the strong room or vault beneath. Above the entrance there is a strong closet or chamber, into which the receptacle rises; this closet is provided with doors and suitable fastenings.

The mode of securing the receptacle in the vault is effected by what is called an hydraulic bolt or bolts, to which the security of a lock may be added. This part of the invention is more particularly described in the series of Abridgments relating to "Locks, Latches, Bolts, and similar Fastenings."

[Printed, 1s. Drawing.]

A.D. 1855, November 22.—N° 2632.

PRICE, GEORGE.—This invention relates to the preservation of papers and documents from the effects of steam or vapour when inclosed within an iron safe constructed upon the "vapourizing principle," according to "Milner's patent, 1840," such safe being exposed to the action of fire. It consists in depositing such papers and documents within a box or receptacle of wood or other suitable material, which box is to be hermetically sealed, and provided with an expansion valve, and then placed in the iron safe. In order to seal the box effectually, it is lined with

of money, books, papers, and other valuable property from the effects of leakage or other incidental casualties to which sea going and other vessels are liable. This safe consists of a double box or case, or one case so disposed within another respectively of such relative sizes, that a thin air-tight cavity is formed between them, being in fact a case or box with hollow top, bottom, and sides; this surrounding cavity may be divided into air-tight compartments having collectively the capacity of containing sufficient air or cork to render the safe buoyant in case of immersion. The inner case constitutes the receptacle or safe where-in the property is to be deposited, and to the outer case is to be fitted a socket to receive a flag staff, for the purpose of attracting attention in the event of the safe being cast away.

"The frame or body of the safe is supplied with double doors
"also of a cellular construction, and so adjusted as to shut one
"over the other, each door being made to act individually and
"rendered perfectly water-tight by the application of a packing of
"india-rubber or other suitable material, such material being
"pressed into grooves or channels made in the inner faces of each
"door, the two doors being pressed firmly into the packing by
"means of screws, keys, or other suitable contrivance. The
"requisite even bearing of the said doors on to the packing is
"obtained by the employment of suitable spring hinges made
"for that purpose."

The safe may be mounted on wheels or castors.

[Printed, 10d. Drawing.]

A.D. 1857, April 16.—N^o 1075.

CROOK, SAMUEL THOMAS.—(*Provisional protection only.*) —
This invention relating to the construction of metallic safes, chests, and numerous other manufactured articles of iron, is consisely described by the inventor as follows:—

"Instead of the usual methods of making or manufacturing
"retorts, safes, &c., by casting them of molten metal in moulds,
"or making them of wrought or malleable metal, by rivetting
"or dovetailing the sheets or plates together, I propose to weld
"sheets or plates of wrought or malleable iron together, to the
"required shape, size, or configuration suitable for retorts, safes,
"or similar purposes."

[Printed, 4d. No Drawings.]

A.D. 1857, September 25.—N^o 2481.

CHUBB, JOHN.—The object of this invention is to render iron safes, and the doors of strong rooms drill-proof. It is stated that such depositories have been opened by drilling holes through the iron plate which covers the lock, and in this way gaining access to the tumblers of the lock for an instrument by which the tumblers have been raised, the bolt set free, and the lock opened.

The present invention is designed to render such attempts upon safes and strong-room doors, as the cutting or drilling a hole through their iron walls and door, if not impossible, at least a very difficult operation, for which purpose the backs of the iron plates have holes drilled all over their inner surface, and these holes are respectively tapped each to receive a small screw plug of hardened steel. "When an attempt is made to drill through a plate so arranged, the drill soon comes in contact with one of these hardened plugs and is broken by it. In place of screw plugs, plain pegs of hardened steel kept in their places by a second plate at the back may be employed. In some cases also I place behind the exterior plate of the safe or door a plate of corrugated and hardened steel, which also will break the drill and render it useless. With a similar object, I sometimes fasten at the back of the exterior plate a series of steel strips at a short distance apart."

[Printed, 6d. Drawing.]

A.D. 1857, October 21.—N^o 2687.

SLAWSON, JOHN B.—(*A communication.*)—The object of this invention is to prevent the drivers of public vehicles, conductors, and steam boat clerks from defrauding their employers, as also to prevent fraud on the part of passengers.

It "consists in the use of a box securely locked, and if necessary, sealed by the employers, into which it is imperative that the passengers shall drop their fare. This box is so constructed, that the money deposited by the passenger shall be arrested by a sliding board or apron until the person authorised to collect the fare shall satisfy himself that the amount deposited is correct, which he is enabled to do by means of glass lights inserted in the front of the box, between which the money lies for that purpose, after which if correct, he causes it to drop into a box arranged underneath for its reception by pulling or

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“ jerking back the sliding board or apron to permit the money to
“ pass into the box, when a suitable mechanical arrangement
“ causes the sliding board or apron to return to its original
“ position to reclose the passage to the box.”

[Printed, 8d. Drawing.]

A.D. 1857, November 25.—N° 2947.

HOGG, JAMES.—(*Provisional protection only.*)—This invention relates to the construction of a safe or depository adapted for the reception of money, deeds, or other valuables.

It “ consists principally of two parts, namely, an outer casing
“ or box and an inner receptacle or tray. The outer casing,
“ (which may be constructed of iron, copper, or other suitable
“ material) is of a flat cylindrical form, and may be made of any
“ suitable diameter and depth; this outer casing or box is closed
“ entirely at the bottom, the circumference, and the top, with the
“ exception of an opening in the latter of a triangular or seg-
“ mental form, comprising one-fourth, one-sixth, or other suitable
“ portion of the area of the top of the box. This opening is
“ closed when desired by means of a sliding or revolving shutter,
“ turning freely upon a centre pin or axle and sliding in close
“ contact with the top or cover of the box.”

“ The sliding or revolving shutter is secured when closed by
“ means of a lock of any suitable construction. If the safe is
“ intended to be portable, the outer casing or box is furnished
“ with a handle or handles of suitable form.”

The inner receptacle or tray has the form of the outer casing wherein it fits loosely so as to be capable of turning upon a central pivot. It is open at top and is divided into segmental compartments by radial partitions, and has a lock, spring, or catch, which must be relieved or unfastened between each divisional rotation, one compartment only at a time being accessible through the opening in the top of the outer case and that only at such times when the shutter is unfastened and slid aside. This safe may be made fire-proof by any of the ordinary means or appliances in use for that purpose.

[Printed, 4d. No Drawings.]

1859.

A.D. 1859, March 21.—N° 717.

RHODES, WILLIAM.—According to this invention safes are rendered fire-proof by means of a flow of cold water through a cavity formed between the inner and outer casings which constitute the walls or body of the safe, and also between the plates which form the outer and inner surface of the door. The water is admitted by a lever valve operated by a float which only opens the valve when the temperature of the water in the cavity reaches 212° Fahr., and is freely evaporating. Whilst the valve is open fresh cold water flows through the cavity in a constant stream, carrying off the heat which passes through the outer casing, so that the inner casing is kept comparatively cool and the contents of the safe uninjured. The valve is disposed at the end of the supply pipe in the cavity at the back of the safe. The axes on which the hinges turn are made tubular and respectively constitute the induction and eduction passages to the cavity of the door, the water flowing in from the main cavity which surrounds the body of the safe through the upper hinge, and passing back through the lower, the main supply and exhaust pipes respectively being connected to and passing through the bottom of the safe, terminate at different levels within the cavity of the outer casing.

The interior of these safes is surrounded by a second lining of sheet metal disposed so as to form a thin cavity for air.

[Printed, 10d. Drawing.]

1860.

A.D. 1860, April 27.—N° 1071.

WITHERS, GEORGE.—(*Provisional protection only.*)—This invention relates to the manufacture of metal plates adapted to the construction of safes, chests, and closets, and to the locks employed which are also applicable to general purposes, consisting :—

1st. " In making the outside plates of safes and closets of iron
" and steel welded together, and reduced by rolling to the desired
" thickness, which plates, in the last process, I purpose passing
" between rolls that shall impart to them a series of ridges or

"chequers on one or both sides. Plates thus made will, from their uneven surfaces, render the act of drilling very difficult, and from the inside of the plate being of iron, it will bend and bulge rather than crack or split from beating, and from such plates I purpose mainly making the body of safes, chests, and closets, as also for the outside and inside of their doors or covers, for the better protection of the lock or locks of such doors."

2nd. "In the use of solid bands either on the outside or inside of such safes, chests, and strong fire-proof rooms, for securing the parts together."

3rd. "Making the lock or bolt plate for receiving the lock bolt or bolts solid with the plates of the inner body of the safe, chest, or closet."

4th. "Finishing the interior of such fire-proof safes, chests, or rooms, by lining them with slate or marble, or coating the inner surface of the plates with enamel, or lining them with non-inflameable paper or woven fabric."

The fifth part of the invention relating to the construction of the locks will be found described in the vol. of Abridgments devoted to that series. These locks it is stated are applicable to safes, chests, and strong-rooms generally, and also to other purposes of security against picklocks and the action of explosive substances.

[Printed, 4d. No Drawings.]

A.D. 1860, May 28.—N^o 1308.

CHATWOOD, SAMUEL.—This invention relates to the preparation of the iron plates and to the general construction of iron safes, to making the doors of safes gunpowder proof, and to the locks employed.

1st. "In forming the body of safes I procure iron plates of a suitable strength for the outside or parts of the outside, having its inner surface rolled or cut into grooves either in one direction only, or crossways, or with cavities or indentations of a conical shape or other configuration. These plates are fastened at proper distances from plates of suitable strength forming the inner part of the case, by studs, rivets, screws, or other means. The case being thus formed with a cavity between the outer and inner skin, I then fill the cavity between the plates with

“ fluid metal, which, on its contact with the cold plates, acquires
 “ such a degree of hardness as to resist the action of any cutting
 “ instrument. The indented or uneven surface which the hard
 “ metal will have acquired will break or destroy any kind of
 “ cutting instrument which may be applied to it after the outer
 “ plate is cut through. In certain cases I use plain surface plates
 “ for both outside and inside, with hard plates between, cast either
 “ plain on both sides, or the outer side with ribs, cones, or any other
 “ uneven surface which will destroy the edge of a cutting instru-
 “ ment. Either of these methods may be adopted to the whole
 “ or any part of the safe.”

2nd. The process adopted for making the doors of safes capable
 of resisting the explosive effects of gunpowder “ consists in at-
 “ taching or fixing the lock chamber to the door by a suitably
 “ strong spring or springs so as to permit the front edge of the
 “ door being separated from the lock chamber to a slight extent,
 “ or as far as is permitted by catches. On gunpowder being put
 “ into the lock and exploded, the force of the expansion within
 “ the lock chamber will separate it from the door so as to allow a
 “ portion of the compressed gasses to escape, immediately after
 “ which the lock chamber and door will resume their proper and
 “ secure position.”

The third part of the invention relates to the construction of
 the locks employed, which locks are also applicable to general
 purposes, and are more particularly described in the series of
 Abridgments relating to “ Locks, Latches, Bolts, and similar
 “ Fastenings.”

[Printed, 8d. Drawing.]

A.D. 1860, September 13.—N° 2211.

PRICE, GEORGE.—(*Provisional protection only.*)—This inven-
 tion, having for its object “ an improvement in the manufacture
 “ of drill-proof safes ” is described by the inventor as follows:—

“ My invention consists of an improved method of rendering the
 “ doors and other parts of wrought-iron safes and strong-room
 “ doors drill-proof by coating them with steel, similar to my
 “ former Patent (dated January 31st, 1855, No. 236); but, in-
 “ stead of producing this result by the “ case-hardening ” process,
 “ as therein specified, I produce the iron plates with a surface of
 “ steel on one or both sides, and of any required thickness, in the

"course of their manufacture (that is to say) by "piling" the iron and steel together to form the "pile" or "billet" of which the sheet is produced by passing through the rolls. Any desirable kind or quality of steel may be used, and the hardening of the steel surface may be effected by any of the usual methods employed in hardening steel."

"As I purpose using both the foregoing methods, I do not intend this latter to supersede my former patent."

[Printed, 4d. No Drawings.]

1861.

A.D. 1861, August 10.—N° 1993.

STOCKER, ALEXANDER SOUTHWOOD, and STOCKER, ALEXANDER RICHMOND.—This invention relates to the process of manufacturing drill-proof bars and plates adapted to various purposes, including the construction of safes, the object being the partial conversion of such bars and plates into steel, so that the central portion of the bars or plate so prepared shall still retain all the fibrous nature of iron, whilst the outer surfaces have all the qualities of steel. The puddled bars or plates are first placed in a converting furnace, and then operated upon after the manner practised in the process of making steel; they are then piled together and, after being heated to a welding heat, are passed between rollers and by the pressure welded and combined, and reduced to the proper size and thickness either uniform throughout or varying according to the configuration of the rollers. Plates converted by the first process, may be used alone or welded to iron plates for the purpose of producing combination plates, consisting of steel on one side and iron on the other. By adopting this process the uncertainty of case-hardening is avoided, and also the labour and risk of subsequent deterioration, caused by having to reheat, hammer, and straighten the metal.

[Printed, 4d. No Drawings.]

A.D. 1861, September 14.—N° 2299.

WEBB, THOMAS. — (*Provisional protection only.*)—The object of this invention, which relates to the construction of tills

or receptacles for money, "is to prevent persons unlawfully taking money from the tills of shops' counters. I propose arranging the till in such a manner that it shall represent a double drawer, one sliding within the other. The inner till is provided at its extreme end with a catch lock, so that when the till is closed the inner receptacle becomes fastened. It is thus evident that any person now attempting to open the till will merely withdraw the outer casing, leaving the money in the inner one. A treadle is employed for unlocking the inner till, to which is attached a rod actuating a spring, which releases the catch of the lock, and thus allows the inner till to be withdrawn simultaneously with the outer one. The treadle may be removed by unhooking it from the spring in order to elude observation."

[Printed, 4d. No Drawings.]

1862.

A.D. 1862, January 29.—N° 232.

PULVÉ, LOUIS ALEXANDRE.)—(*Provisional protection only.*)—This invention relates to the construction of "fire-proof iron chests and strong boxes," composed of a double casing on all sides. It is described as follows :—" Each side of the first casing will be formed of two sheets of iron riveted with countersunk rivets on to an iron framing the thickness of which will be regulated by the space which it is desired to reserve between the two sheets of iron. The outer door which closes the safe will precisely resemble the sides, and will turn on a pivot top and bottom. To preserve the chest and make it fireproof I propose to introduce between the two sheets of iron a fire-proof body composed of very refractory silicious sand, and to strengthen it I purpose placing fillets or bands of iron on all the outer angles of the chest. The inner casing will be constructed in the same manner, and of similar material as the outer, the space left between the two sheets of iron being the same, but in this case stuffed full of raw wool, which will render the interior still more inaccessible to heat. The distance

“ between the door of the inner and that of the outer chest will
“ be about five times greater than that between the other sides.
“ The top of the outer chest will be surmounted by a sort of attic
“ of sheet iron, carrying a wooden cornice, and there will there-
“ fore exist an inner vacuum or space. The base will be formed
“ of wooden plinths fixed on the iron uprights of the outer
“ frame, and the result will be that the chest will be supported
“ not only by the plinth, but also by four feet. The interior of
“ the second or inner chest will be provided with an iron shelf
“ supported on iron blocks or brackets, and it may be lined with
“ silk. I purpose applying any sort of lock or fastening which
“ I may find desirable.”

“ I have submitted an iron chest constructed as above to the
“ most violent heat for a period of two hours, and have then
“ withdrawn deeds and other articles intact.”

[Printed, 4*l*. No Drawings.]

A.D. 1862, October 13.—N^o 2750.

CHATWOOD, SAMUEL.—This invention relating to the construction of fire and thief-proof safes and depositories refers:—

1st. To the manner of working the combination steel and iron plates employed; these plates denominated “iron steel,” are composed of one plate of steel laid between two plates of iron, the three plates being welded together whilst heated almost to a state of fusion; a plate of sufficient length to form the four sections comprising the top, bottom, and two sides, is bent right angularly to form the corners, and the two ends are welded or rivetted together. The edges of the plate which forms the back are either welded, dovetailed, or rivetted to the sides, or to angle-iron attached thereto. The outer bands are taken in one length, and separately bent to surround the body of the safe, the ends being welded together. The frame round the front supporting the inner lining and forming recesses for the bolts and dogs, is either of iron or steel in one piece suitably bent and the ends welded.

.. The bodies of safes are made in one casting of homogeneous or other ductile metal, or of metal that can be hammered or “rolled into nature,” annealed or otherwise made ductile after being cast. The lock chamber with the necessary bolt holes, is *cast in iron or steel, as also the lock frame or case.*

2nd. Wood saturated or charged with a solution of sulphate of copper, sulphate of iron, sulphate of ammonia, alum, or other substance, is used for the inner lining and internal fittings, and drawers of safes, chests, doors, and strong rooms, and the circum-vesting cavity formed between the outer body and the lining, is filled with carburet of iron, sulphate of barytes, sulphate of lime, or other non or slow heat-conducting substances, among which are embedded vessels of glass or earthenware hermetically sealed and containing bisulphuret of carbon, sulphurous acid, or substances which vaporize at a low temperature, the intention being, that these vessels shall, when exposed to heat, burst or fracture, and the escaping vapour shall carry off all excess of heat, and keep the interior and contents of the safe below a damaging temperature.

3rd. Relates to the case-hardening of safes, chests, doors, or strong rooms, made of "iron steel" or other partially converted or ductile steel, by any of the well-known methods, or the parts which require to be drill-proof are sufficiently heated and then suddenly cooled, and the whole or portions including the lock may be enamelled with vitreous or ceramic substances, as described in a prior Patent dated May 28, 1860, No. 1308.

4th. Protecting safes, chests, and strong-rooms, against the effects of gunpowder or other explosive substances, by the use of safety valves and apertures, which permit of the immediate escape of the gases; and filling the lock chamber with any elastic absorbent (that will not obstruct the bolts) saturated with a preparation of glycerine and paraffin or other substance which retains its "hibreacating" properties, and when compressed for the purpose of inserting gunpowder, will give out its glycerine, and to a certain extent render the powder inexplusive.

5th. Relates to the shape of the case of the small lock, its internal configuration, and to the bolts and other fastening details, the object being to protect the lock from the action of acids, and reduce the space available for the introduction of gunpowder or other deleterious substances to the smallest possible limit.

[Printed, 1s. Drawing.]

A.D. 1862, December 12.—N^o 3327.

WINIWARTER, GEORGE.—(*Provisional protection only.*)—This invention relates to a system of forming the walls and parts of

structures generally, including the manufacture of metal safes. It consists in the use of metal tubes, placed side by side and bound with straw or other suitable material steeped in clay, mortar, or cement, the ends of the tubes being confined in appropriate recesses or grooves formed in the girders, posts, supports, or framework, the object being to construct a bad or slow heat-conducting air-tight wall or surface, occupying little space, but possessing considerable strength. The tubes employed may be of any desired transverse sectional form, and in some cases instead of perfect tubes, the lengths or bars of metal may be hollow or trough-shaped.

[Printed, 4d. No Drawings.]

1863.

A.D. 1863, March 3.—N° 594.

PRICE, GEORGE, and DAWES, WILLIAM.—This invention, relating to the construction of "burglar-proof safes and strong-room doors and frames," and to the fixing and protecting the "locks, consists :—

1st. As regards safes, in making by means of strong angle iron fixed round the front of the safe, a deep recess or groove for the reception of longitudinally sliding bars or bolts, which are notched at intervals to form projections that engage with claws formed out of the solid metal round the door, and constitute the main fastenings, small locks being employed to secure them when slid into position by levers, or by a follower actuated by a suitable spindle and knob.

2nd. Relates to the manufacture of the plates, and other iron work, the object being to make the door or other portions of the safe and the doors of strong rooms drill-proof, and, as stated by the inventors, "we in some cases obtain the desired degree of "hardness by casting upon a wrought-iron plate a "facing" of "any required thickness of white or hard iron, the wrought plate "being furnished with projections, such as screws, rivets, dogs, "claws, or Z-iron, round and amongst which the white iron is "*poured, and will unite the plates together. We also in some*

“ cases drill the wrought plate, and countersink on the back or inner face to allow the white iron to pass through the same and form rivets for assisting in uniting the plates. The wrought plate may or may not be heated whilst the white iron is being cast upon it, and the white iron may or may not be “ chilled ” on the outer face, as may be found desirable. In some cases, we prefer casting the white iron separate from the wrought plate, with perforations on the inner face, in which we insert pieces of hard “ pot ” or other hard mineral substance before securing the wrought and cast plates together, the object of these being to break drills or other tools which may be used in any attempt to drill the door or other portion of the safe, or the strong-room door.”

3rd. Relates to the means employed for the protection of the working mechanism of the locks from the corrosive action of acids or other chemicals introduced through the keyhole.

The parts of this invention which more particularly relate to the locks and fastenings are more fully described in that series of abridgments.

[Printed, 8d. Drawing.]

A.D. 1863, August 11.—N^o 1973.

ROBSON, JAMES, junior.—(*Provisional protection only.*)—The object of this invention, relating to the construction of tills, is to provide means for detecting the abstraction by fraud or otherwise of any money placed therein. Two plans are devised for this purpose.

The first described consists in dividing the till into two compartments, one, being open for the use of the shopman or attendant, is always to contain a stated sum, and the other is closed and locked by the proprietor, the key remaining in his possession, a slotted opening of sufficient size being made in the top or cover, through which the attendant drops the coin received, always retaining the stated sum in the open compartment. The manner of working the till is as follows :—If the purchase of an article come to, say ninepence, and a shilling be offered, the attendant takes ninepence out of the open compartment and drops it through into the compartment which is locked ; he then puts the shilling into his open compartment and takes out threepence, the amount

of change due to the customer. By this process the stated sum in the open compartment should always remain the same at all times, so that if a portion be taken, detection by the master or assistant will follow.

The second contrivance consists of a receptacle suspended by a rod from a spring balance and inclosed in a locked case or compartment; its acts by gravitation, and is intended to detect the abstraction of money from the closed compartment of the till, the arrangements with regard to the stated sum in the open compartment remaining the same as first described.

[Printed, 4d. No Drawings.]

A.D. 1863, October 30.—N° 2690.

RUSS, BARNABAS.—This is an invention principally relating to the construction of iron ships, batteries, armour plates, etc., and amongst other details to a concrete or composition, adapted for filling up the cavities formed between the outer and inner plating of ships, and also applicable for use as a protecting medium between the inner and outer cases of fire-proof and thief-resisting safes.

This composition consists of pitch, tar, asphalte, resin, and broken clinker or stone such as granite, in the following proportions, viz.: One 4th part of pitch, one 4th part of tar, two 4ths of asphalte, and a small portion of resin, the quantity of broken clinker or stone to be mixed with these ingredients is to be equal in bulk to all the others put together.

The processes described for combining by welding, plates of steel and iron, may also be available for safes and similar depositories. A steel plate of any desirable thickness is laid between two iron plates in a suitable furnace, and as soon as they have attained a welding heat, they are withdrawn and passed between rolls, the result being a steel plate with iron surfaces.

If such a plate requires annealing, it is received from the rolls on a tram, and placed on dry wood dust spread over a bed of newly burnt lime; a small quantity of wood dust is then spread on the top side of the plate, and the whole is covered up with another layer of lime. Instead of steel, the hardest and toughest iron, such as Taranaki or Low Moor, may be substituted. In some cases a flux, such as borax or oxide of manganese may, previous to

the welding process, be applied to the surfaces of the plates to promote cohesion.

[Printed, 1s. 10d. Drawings.]

A.D. 1863, November 14.—N° 2851.

COURTNEY, GEORGE HENRY.—(*Provisional protection only.*)

—The object of this invention relating to tills and receptacles for money, is the adaptation thereto of an apparatus whereby each piece received can be checked or examined, and those latest received can for a limited time be retained in separate cells.

The apparatus consists of a flat circular chamber formed within a cylindrical shell of metal or wood. The top of this chamber is closed with a glass cover, and the bottom is formed by the plate or wood work which constitutes the top of the general till or receptacle, upon which it is fastened down. Within the chamber there is a circular tray divided into segmental compartments by radial partitions. This tray is free to revolve, being fixed to and supported by a vertical spindle which passes centrally through the cover of the apparatus.

The bottom of each compartment of the tray is a kind of loose flap hinged on one side to one of the radial partitions, so that as the tray revolves, these flap bottoms come by turns over and fall into an opening which communicates through the woodwork with the till below. After a flap has fallen, and the money the compartment contained has slid down into the till, the flap is raised by the next movement of the tray, and the then empty compartment comes under a slotted opening in the glass cover, ready for the reception of the next coins received, the tray after each receipt being moved round the space of one segmental division by means of a knob, which is fixed on the top of the spindle. By this arrangement the separate coins or sums received remain in sight until by the successive movements of the tray, they are carried round to the opening and fall into the till.

[Printed, 4d. No Drawings.]

1864.

A.D. 1864, March 2.—N° 527.

GAZE, GEORGE.—This is an invention of a money till divided into two compartments, one containing a number of open bowls is placed over the other, which is locked and receives the money taken through a slit or slits, the open bowls being for the purpose respectively of holding change, one for crown pieces, another for half-crowns, a third for florins, etc. The pieces which are dropped through into the lower receptacle, fall upon a signal bell, and also in some cases into a sliding tray divided into compartments which, in rotation for a given time severally receive the money taken, so that the amount of money taken during any stated portion of the day can be ascertained, the separate amounts in the several bowls always remaining the same. The mode of operating is fully described.

[Printed, 10d. Drawing.]

A.D. 1864, May 14.—N° 1230.

JONES, RICHARD.—The object of this invention is the construction of a money till, whereby the coins received from customers are kept separate, and pilfering or embezzlement on the part of attendants is, "as much as possible," prevented. It is described by the inventor as follows :—

"The frame is made drawer fashion, and may be either of wood or metal (by preference the former), in which three divisions are made in a longitudinal direction, the upper one being fixed, and divided into three money compartments; the middle longitudinal division is a sliding drawer, by means of which the necessary action is given to the apparatus, and the lower division is the money drawer, which is finally to receive the coins deposited. It has been mentioned that the upper longitudinal division of the frame is fixed, and divided into three money compartments, which are proposed to be so arranged that those on the left and right hand are intended for silver coins, and over which is a glass top, (through which the coins may at any time be seen and recognised), the center being so divided that at the farther end a compartment is reserved for gold coins, over which may also be placed a glass

“ top, the remaining space being reserved as a convenient receptacle or receptacles for copper and silver, and over which no glass top is intended to be placed, this compartment being merely intended as a convenient receptacle in which a certain quantity of loose change may be held. The left and right hand divisions (which are intended for silver coins) are again divided vertically by means of wooden or metal flaps, which may be of any number, but the number of which must of course be regulated by the length of the frame. These flaps, as applied to the silver compartments, I call the check flaps, and they are loosely hung from their upper parts in the frame in such a manner that their lower ends fall upon the sliding drawer, by means of which the action is given. These flaps are fitted with a groove of suitable shape and size to allow levers . . . to be drawn through them by the action of the sliding drawer. The levers are pieces of metal or wood of a suitable shape, which are also hung loosely in the frame, but which are placed in the bottom parts of the silver compartments. The use of these levers is to raise the check flaps upon the closing of the sliding drawer.”

The action of the apparatus is described.

[Printed, 8d. Drawing.]

A.D. 1864, October 10.—N° 2485.

GARDNER, WILLIAM.—This invention relating to the construction of iron safes designed for the protection of property from thieves or fire refers :—

1st. To the door which is “formed of two iron plates suitably bound or secured together with a space between them of about one inch, more or less, according to the size and character of the safe. The outer plate is lined with steel to resist the efforts of thieves, and the remaining space is filled with a suitable composition, preferably consisting of about equal proportions of charcoal, whiting, alum, and sawdust, to resist the action of fire.”

2nd. The “safe has two bottoms, a fixed or stationary bottom, and a false or removable bottom placed below the former. The fixed bottom has sunk in its lower surface a channel extending from the door to the back, or from side to side. This channel has a groove upon each side, preferably in the shape of a female dovetail, and is of sufficient width to receive

“ a projection formed on the false bottom, the latter being preferably in the shape of a male dovetail, the object being to unite the two bottoms firmly together. In the said projection are formed one or more holes for the insertion of screws or bolts, by which means the safe may be securely fixed in its position upon the floor. These holes may be so arranged that the screws or bolts will pass through the beams or joists supporting the flooring. When the false bottom is in position, it is fixed by means of one or more screws passing through the stationary bottom, and thence into the said false bottom. The heads of these bolts or screws are under the door of the safe, so that when the door is closed, these screws are covered over, and consequently the false bottom cannot be removed.”

[Printed, 1s. Drawings.]

1865.

A.D. 1865, January 9.—N^o 71.

WIESE, FRIEDRICH.—This invention relating to the preservation from the action of fire of books and other articles deposited in safes, is concisely described by the inventor as follows :—

“ My invention consists in fitting or placing inside the safe a box or apparatus formed with small holes and containing any material (unburnt kali, alum, for example) which in its normal condition has no injurious effect on the iron of the safe, and which on the heat reaching such a high temperature as would injure the contents of the safe, immediately generates steam, so as to damp the books and other articles in the safe, and thereby preserve them from fire.”

[Printed, 4d. No Drawings.]

A.D. 1865, January 12.—N^o 104.

GAZE, GEORGE.—This invention, relating to tills and means for securing and checking money taken by attendants, consists “ in the application of an audible signal to a revolving or movable till which exposes the coin after it is introduced, and working such till in combination with a locked till or receptacle into which the coin drops, and an open till in which coins are kept

“ for giving change. This latter till receptacle is provided with
 “ a given amount of change, say one pound’s worth, more or
 “ less, in each receptacle of such till, which at all times remains
 “ the same in amount, and as described in the Specification of
 “ a Patent granted to me, No. 527, dated March 2nd, 1864. The
 “ audible signal is made at the time the coin is placed in the
 “ exposed till. I do not introduce coin received unless it be the
 “ exact amount of the takings. If change is to be given I place
 “ the coin received in one of the open receptacles; supposing it
 “ to be half a crown piece, and sixpence the amount of the
 “ takings, two shillings and a sixpenny piece are removed from
 “ the open receptacle, and the half crown substituted, thus the
 “ amount in the open receptacle remains the same; two shillings
 “ are given in change, and the sixpenny piece put into the re-
 “ volving or exposing till, which is moved round a step, passing
 “ the coin under a glass, and securing it as in a locked recep-
 “ tacle. At the time of introducing the coin, the audible signal
 “ is produced by the movement of the rotating till, which signal
 “ may be produced by a bell being struck by a hammer put into
 “ action by the movement of the till, or by other analogous means.
 “ The coin so inserted will be seen through the glass during
 “ several succeeding stages of movement of the exposing till,
 “ and can be seen by the proprietor if he chooses to examine it;
 “ the coins so taken ultimately drop into a locked receptacle
 “ underneath. I dispose the open till for giving change below,
 “ or on one side of such locked till or receptacle. If desired, a
 “ registering apparatus may be connected with the revolving till
 “ to register and indicate the number of movements in a given
 “ time which should agree with the number of coins found in
 “ the locked receptacle. This double till, one locked for receipts
 “ or takings, and the other open for change as described, may
 “ be worked without a signal apparatus if desired, and instead
 “ of the exposing till rotating, it may be slid longitudinally, or
 “ moved in any other direction.”

[Printed, 10d. Drawing.]

A.D. 1865, February 6.—N^o 326.

SHAW, ROBERT.—This invention relates to the construction of
 a window safe or enclosure, adapted to the windows of jewellers
 and other shops for the security and protection of the property
 therein deposited.

It consists in fixing inside the window a suitably grooved frame work of iron or steel, or the two metals combined; in this frame, fitted to slide in the grooves either up or down, are two doors, to which are fixed toothed racks, one on each side; these racks are actuated respectively by two pinions fixed on the axis whereon is also mounted a worm wheel that is set in motion by worms on a horizontal shaft, which is caused to rotate by means of a handle in either direction, the doors when not required to be closed, being raised either up to the level of the ceiling, or lowered below the floor.

[Printed, 10*d*. Drawing.]

A.D. 1865, February 9.—N° 364.

CHUBB, JOHN.—This invention relating to the construction of safes and strong-rooms, has for its object means for preventing or rendering the “ door of an iron safe less liable to be forced open “ by the introduction of thin hard steel wedges between the “ frame of the door and the bevelled edge of the door, so as to “ take advantage of the incline on the interior edge of the door; “ the frame in place of being made flush as heretofore, is made “ to project beyond the door, so that the door will be recessed; “ and further to protect the door and the keyhole or hole through “ the door of a strong-room or iron safe, a hardened steel bar is “ applied external of the door and from side to side thereof, and “ such bar is fitted with a groove across the door. It is preferred that this bar should be of a curved convex form externally, “ and flat on the side where it comes next the door. At each “ side of the framing of the door is fixed or formed a projecting “ socket, into which the bar is slid after the door has been shut “ and fastened or locked. It is preferred that the sides of the “ groove across the door in which the bar is fitted should be “ undercut in order better to insure that no thin steel wedges “ shall be introduced between the door and the bar. The bar is “ fixed in position by the bolt or catch of a lock.” If desired more than one bar may be employed.

[Printed, 8*d*. Drawing.]

A.D. 1865, February 15.—N° 439.

CLARK, ALEXANDER.—(*Provisional protection only.*)—According to this invention, burglar and fire-proof safes are made in

one piece of iron, cast in a chill mould. The form of these safes is either spherical, or cylindrical with hemispherical ends, and the doors are concave or curved, the object being to present no angles whereon a burglar could operate. They may be made rectangular if desired, but in all cases the doors are either curved or polygonal, and small in comparison with an ordinary safe door, which occupies the whole area of the front. Instead of chilled cast iron these safes may be made of hardened steel externally, for the purpose of resisting the penetration of drilling tools. When required to be fire-proof the safes are encompassed by a brick-work casing bound with iron, and furnished with a door of the same fire-resisting material. When not required to be thief-proof, the spherical or cylindrical form may be modified.

Making the door of a wrought-iron safe either circular or many-sided, and so small that it only occupies a portion of the front, so that it may be closed within a strong surrounding frame. Clockwork is made to detain the bolts until the stated time for opening.

[Printed, 4d. No Drawings.]

A.D. 1865, February 16.—N^o 450.

THOMPSON, JOSEPH.—This invention relating to the construction of safes, has for its object the prevention of safes being
 “ forced open by driving steel wedges between the door and
 “ frame of the safe, and then when the frame is sprung back
 “ introducing a lever, by means of which such force has been
 “ applied as to tear the front plate of the door away from the
 “ lock. In order to prevent the separation of the lock from the
 “ door I cause the bolts to shoot through an inner flange or
 “ through lugs formed solid or in one piece with the door plate ;
 “ and in order that the bolts may not tear out from the holes
 “ into which they shoot, I cause the bolts to shoot behind an
 “ internal flange formed solid or in one piece with the casing of
 “ the safe ; this flange also serves to render it difficult to use
 “ wedges in the manner described, as it forms a stop, preventing
 “ them entering to a distance greater than the thickness of the
 “ door plate. Further to prevent the effective application of
 “ leverage in the manner described I apply a strong band or ring
 “ all round the safe at the front, so as to overhang or project in
 “ front of the door when closed, so that the door shuts as it were
 “ into a recess, thus the fulcrum of the lever is thrown back to a

“ distance from the door, and so the obtaining sufficient leverage
 “ is rendered impracticable. The band or ring should be shrunk
 “ on the safe, and further fixed by screws and dowels, or other-
 “ wise, or it may be made solid with the casing.”

A strong box constructed in a similar manner is shown, and a method of making the flanges near the door available for giving greater security on the hinge side.

[Printed, 10d. Drawings.]

A.D. 1865, February 17.—N° 459.

FERGUSSON, JAMES.—(*Provisional protection only.*) — This invention relates to the construction of iron safes and strong-rooms.

The iron doors instead of turning on hinges are “ made to
 “ slide up and down in grooves at the sides and at the bottoms,
 “ and they are counterbalanced on chains passing over pulleys.
 “ In order to prevent such chains being used as means of raising
 “ the doors, the links or connecting instruments are made of
 “ such strength only as to allow of their being used when the
 “ doors are free, and to break in the event of power being applied
 “ to force the doors with a view to open them in opposition to
 “ the bolts or fastenings of the locks. On each side of a door
 “ a sufficiently deep groove is formed to receive and retain the
 “ door, and such is the case in respect to the bottom of the frame
 “ to receive the bottom of the door. The upper part of the door
 “ is by preference made flush with the upper surface of the top
 “ frame of the door. In some cases over the top of the door a
 “ slide or cover of hardened steel is applied, which being locked
 “ or fastened securely offers an additional security to the door of
 “ a safe or strong-room. In other cases a safe may be moved
 “ back into a recess and be fastened or secured therein so as to
 “ prevent the door being opened till the safe is again moved
 “ forward.”

[Printed, 4d. No Drawings.]

A.D. 1865, February 22.—N° 499.

SHORE, GEORGE NATHANIEL.—This invention relates to the construction of iron safes and strong-rooms, and to the arrangement and mode of fastening. As applied to the frame and door of an iron safe or strong-room, it consists in fitting into the angle

formed round the door-frame, against and into which the door shuts, hardened right angled triangular shaped bars by preference of tempered steel; the hypothénuse or diagonal surface of the bar is made concave transversely, and the inside edge of the door is rounded off to fit and bed, when the door is closed, into the concave surface of the bar. The main fastening bolt ends, which are projected from all sides of the door, are when thrown, secured by four long bolt rods, which are passed from the outside in a direct line through a hole in each bolt head, the bolt rods interlocking where they cross each other at the angles or corners of the safe, and the last inserted being secured by a small lock.

" In place of hanging the doors of iron safes and strong-rooms on axes or hinges as heretofore, a sphere of hardened steel, by preference, is used at the top and bottom of a door, and they enter a semispherical recess formed at the top and bottom of such door. And at the top and bottom framing of the door a grooved recess is formed of a transverse section corresponding with the half sphere, which enters such grooves by which the spherical axes of a door will not only be at liberty to turn in the grooves, but also to move along them and thus allow the door to turn further back."

[Printed, 10d. Drawing.]

A.D. 1865, February 23.—N° 508.

MAPPIN, WALTER SANDELL.—This invention relates to the construction of iron or steel safes and strong boxes with plates which, during the process of manufacture by means of suitably grooved rollers, have a longitudinal series of projecting ribs raised upon one surface, standing out in relief about three times the thickness of the plate. These plates are connected together to form the sides or body of the safe, by means of the ribs in the following manner, viz. :—

1st. " I cut away from the edge of one of the plates a strip somewhat greater in width than the thickness of the plate to be joined to it, but without cutting away the ribs, the said ribs are thus left projecting over the edge of the plate. I will call this the top plate. In the other plate, which I will call the side plate, holes are cut into which the projecting ends of the ribs on the top plate engage. The ribs on the side plate

"are made to engage in holes in the top plate by cutting away a portion of the under part of each rib so as to leave the upper part of the said rib projecting, the said projecting parts engaging in the holes in the top plate. The two plates when thus engaged together cannot be separated by any force exerted in the direction of either of the sides of the said plates excepting such a force as will tear the ribs from the plate. Three sides of the safe are joined together in the manner described; the fourth side may be fixed by the ends of the ribs or flanges on the fourth plate passing through holes in the third plate, and being rivetted therein, and the back may be fixed by rivetting. The ribs or flanges described are also useful for attaching the lock of the safe to as well as the hinges."

2nd. Relates to the mode of completing the junction of the plates by rivetting, and to the peculiar description of rivets employed, which, instead of having as usual a head at one end, are double-shanked, and have a central flange or collar which answers for a head to both ends, the flange coming between the two parts or surfaces which are to be joined together; when the surfaces are required to be brought into mutual contact, recesses are formed in their contiguous surfaces to receive the flange or collar. These rivets cannot be driven in when attempts are made to violate a safe.

Safes made according to this invention may be additionally strengthened by interposing iron or steel belts between the ribs.

[Printed, 1s. Drawings.]

A.D. 1865, February 27.—N^o 543.

TUCKER, WALTER HENRY.—(*Provisional protection only.*)—This invention relates to the construction of fire and thief-proof safes, chests and strong rooms. It consists, in:—

1st. Making the body of the safe so that no external joints appear, wherein chisels or wedges might be inserted. This is effected by either casting the safe or chest entire in one piece of malleable iron or steel, or by welding the parts together so as to form "one homogenous whole."

2nd. Protecting the body of a safe or chest by inclosing it in a "homogenous jacket or case," either cast in one piece or made one by welding together its component parts. In some cases *certain parts only* of the jacket may be cast or welded, and *combined with the other parts by ordinary means.*

3rd. Casting or welding to the doors of safes, strong pieces, into, under, or through which the lock bolts are intended to pass, instead of depending upon the strength of the lock case.

4th. Casting or welding strong projecting pieces inside the doors of safes, whereto the lock case is to be firmly connected.

5th. Casting with or welding strong pieces to those parts of the jacket, or to those parts of the body of a safe which receive the lock bolts.

6th. Increasing the rigidity of the bodies of safes or of their jackets, "by casting with, or welding, or otherwise fixing to the " said bodies or frames certain parts so formed and situated that " recesses or projections in or upon the doors of the said safes, " chests, jackets, or strong rooms shall as the said doors are " closed, fasten upon or into the parts attached to or forming " part of the said bodies or frames, and thereby bind and hold " them firmly together, the doors themselves by this means " being caused to give increased strength and rigidity to the " bodies or frames which surround them."

7th. Casting in malleable iron or steel, the doors of safes, chests, strong rooms, and jackets, and combining therewith in the after process of manufacture, plates of hardened steel, chilled iron, or other drill-proof material.

8th. So contriving the fastenings which secure the plates and parts by casting or welding thereto strong pieces, that they cannot be seen on the outside.

[Printed, 4d. No Drawings.]

A.D. 1865, February 28.—N^o 559.

HART, JOHN MATTHIAS.—This invention relates to the construction of the doors of safes, and to the modes devised for securing the fastenings. Instead of making a single holding for the ends of the fastening bolts in the door frame, the inside marginal surface of the door is furnished with a rib projecting inwards and made of single angle iron, and to the inside surface of the front of the safe or door frame is fixed, with its broadest flange projecting outwards, a bar of double-angle iron so disposed that when the door is closed the projecting rib on the door comes between the flange of the double-angle iron door frame, and the ends of the main fastening bolts pass laterally through the flange plates of both, before they reach the ordinary recess in the door

frame. By this arrangement repeated holding is obtained, and the power of resisting forcible attempts to open the door, thereby proportionately increased. "If desired the bolts may pass through several plates or projections from the door and through several corresponding projections or plates from the door-frame or jamb, and I apply chilled cast iron or steel between the outer plate of the door or cover and parts carrying the bolts. When the bolts are 'thrown' or 'shot' I cause a filling piece or stop to come between their inner end and a suitable stop or abutment to retain the bolts in position. The holding parts of the bolts, and that acted upon by the lock may be formed separately, and be simply connected together by comparatively slight connections to admit of the connecting part being removed by violence without interfering with the holding parts. The back plate or lining of the door or cover I form in several parts, to admit any one or more of them being forced off without thereby necessarily removing the whole of them, and I connect these back plates or lining to the door or cover by short screws from the inside in place of by bolts through the door or cover. I form the edges of the doors or covers with return or overlapping, retaining, and holding plates or stays I form the rebate of the door or cover (or that part of the jamb or frame against which the door or cover shuts) inclined or bevilled instead of parallel to the face of the door, to reduce the power of a screw lever passed through the door or cover and acting on such rebate."

Those parts of this invention which more particularly refer to the nature of the fastenings employed will be found described in the series of Abridgments relating to "Locks, Latches, Bolts, and similar Fastenings."

[Printed, 2s. 10d. Drawings.]

A.D. 1865, March 2.—N^o 585.

CHATWOOD, SAMUEL.—This invention relates to the construction of safes, and to the fastenings and mode of securing them.

Describes a window safe, designed for the protection of property exposed in the shop windows of jewellers, silversmiths, and others. This safe is a kind of enclosed show case, occupying the *window space*, and provided with sliding or hinged shutters to

secure it, otherwise, when open the light passes through it into the shop.

Making the outer cases or shell of a safe of wrought iron or steel, and casting inside it an inner lining, or fitting an inner sheet metal lining to safes and filling the interspace between the shell and the lining with metal in a molten state, the object being in both cases to increase the strength and thickness.

Indenting plates intended to form the sides, ends, backs, and doors of safes, and placing in such indentations spherical or other formed solid pieces, which move and so frustrate attempts to drill through them, the solid pieces being kept in position by wrought or metal lining plates with corresponding indentations.

Combining in the construction of safes, wrought and cast metal. The wrought metal in the form of bars, perforated plates or otherwise is variously disposed in the cavity of the moulds, and when the molten metal is poured in, the pieces of wrought metal are surrounded thereby, and become embedded in the casting. Iron known as "speigle eizen or franklinite," and sometimes steel is used for casting safes either with or without the wrought iron bars or plates. "The speigle eizen" is also mixed with cast iron and used for the same purpose. Steel safes are cast in vacuo to increase their solidity.

Forming a rib on the inside marginal edge of the door to fit, when the door is closed, into a corresponding groove in the door-frame; or projecting studs on the door may engage in corresponding recesses in the door-frame. The edges of the door are curved or notched, and the opening in the door-frame is shaped to correspond.

The screws ordinarily used for fixing the lock chamber are dispensed with, and instead thereof the frame made of suitable iron is fixed into dovetailed grooves in the door-plate. Means are provided for the escape or expansion of the gaseous products of gunpowder exploded within a safe.

That part of the invention which relates to the fastenings is described in the series of Abridgments entitled "Locks, Latches, Bolts, and similar Fastenings."

[Printed, 1s. 4d. Drawings.]

A.D. 1865, March 6.—N° 619.

VARLEY, CROMWELL FLEETWOOD.—The object of this invention relating to the protection of property in buildings, safes, and

strong rooms, is to give notice to watchmen and others on the premises, or at the police or other station, by means of electric signals, of the opening, shutting, or tampering with any safe door or window or other part of a building or property.

1st. As adapted to the protection of a safe, an electric circuit communicating with, say the police station, is caused to pass through the safe from a suitable battery. The signal is given by means of a bell, which is caused to ring if the circuit is broken, which would be the case if the safe were moved or its door opened, the particular house being made known at the station by an indicator. The doors, windows, and parts of a house may be protected by the same means.

"The apparatus at the signalling station consists of an electro-magnet with a movable armature. This armature is mounted on an axle, and has a clip, on which a little tumbler or shutter is supported out of sight, but on the armature ceasing to be attracted even for an instant (which would occur on the breaking of the circuit) this tumbler or shutter falls down before an opening in the case, and shews the name of the house with which it is connected. At the same time it makes contact with what is known as a 'trembler bell' (or with any other suitable bell), which continues to ring by electricity until the current is cut off or the shutter lifted up. At the signalling station a switch is also provided by which the current is cut off during the day, otherwise the bell would ring so long as the doors of the house or safe were open."

2nd. Consists of an arrangement of apparatus whereby an attempt on any particular safe door or window may be indicated.

3rd. Relates to the kind of battery which it is desirable to employ, as it is required to work for months without cleaning.

4th. A terminal insulator of ebonite, to be used when the wires are above ground.

5th. The construction of intermediate insulators.

[Printed, &c. Drawing.]

A.D. 1865, March 6.—N^o 621.

PHILLIPS, SAMUEL, and GROVES, JOSEPH.—(*Provisional protection only.*)—The object of this invention, relating to the construction of safes, is either to prevent the insertion of wedges or chisels between the joints or junctions of the parts, or to render *such attempts futile.*

To this end in "belted safes, we make on the inside of the bar
 " of which the belt is made, a projecting flat rib parallel with
 " the edges of the bar, the said rib being rolled in one piece with
 " the said bar. The outer door shuts down on the outer edge of
 " the said rib, and upon the said rib we rivet a plate of iron. . .
 " . . . The edge of the said plate is not flush with the edge of
 " the rib, but in the finished safe stands somewhat further back
 " than the said rib, the said rib and plate forming as it were
 " steps inside the safe and parallel with its edge, against the inner
 " one of which steps the inner door of the safe shuts, and against
 " the nearer one of which the outer door shuts. The plate
 " against which the inner door shuts has formed in it a series of
 " dovetail grooves, and the edge of the inner door has dovetails
 " formed on it or secured to it, which dovetails take into the
 " dovetailed-shaped grooves in the . . . plate when the door of
 " the safe is shut." By this means the insertion of wedges is
 prevented by the dovetails, or stopped by coming against the
 rib rolled on the bar. In unbelted safes the dovetails are made to
 answer without the use of the rib.

The insertion of wedges between the hinge and side of the safe
 is prevented by rounding the hinged edge of the door, and form-
 ing a corresponding groove wherein it fits and turns in the edge
 of the side frame.

" We make the angles of safes of angle iron, on the outer angles
 " of which a supplementary small angle iron is formed, the said
 " small angle iron being under-cut. The outer plate of the safe
 " is inclined on its edges, and is made to slide under the under-
 " cut bars of angle iron at opposite edges of the safe. The said
 " plates are afterwards rivetted in their place."

[Printed, 4d. No Drawings.]

A.D. 1865, March 8.—N° 653.

TAYLOR, ARTHUR EDWIN. — (*Provisional protection only.*) —
 The object of this invention is so to construct and fit the door of
 a safe into its door-frame, that no direct crevice is formed avail-
 able to drive in a wedge or other instrument employed to open
 the door by forcing out the sides. " For this purpose, instead of
 " hinging the door as usual, I mount and fit it behind a front
 " framing which laps over the edge of the door all round, and is
 " formed with a rebate, so that wedges or other sharp instruments

“ if forced in at the junction cannot penetrate to more than a very slight depth, and which will be quite ineffectual in attempting to force the safe. The door is fitted somewhat in the manner of a drawer (but in a vertical position,) and moves to and fro in an opening formed through the side of the safe across the front, so as to enclose it. I mount the door on wheels for the convenience of moving its weight, which being strong, must of course be heavy. The framing of the door, especially on the exposed edge (when closed,) is made very strong, and although wedges might be inserted between it and the safe frame at that part (the exposed edge) when closed, it would have the effect of springing or rupturing the safe frame at that point only, but would still leave the door of the safe intact; wedges introduced behind the door by reason of the strength of its frame would have little or no influence thereon, and would not conduce to the violation of the safe. I make the rebated frame surrounding the door of sufficient strength, and in one piece with the sides or body of the safe, whose parts I so unite and secure together as to be inviolable, which is indeed generally the case in the present iron safes, the door being the only vulnerable part.”

The manner of disposing the lock and the arrangements connected therewith will be found more particularly described in the series of Abridgments relating to “ Locks, Latches, Bolts, and similar Fastenings.”

[Printed, 4d. No Drawings.]

A.D. 1865, March 11.—N^o 695.

TANN, JOHN.—This invention relates to the construction of fire-resisting and burglar-proof safes, chests, and iron rooms designed for the safety of books, documents, and articles of value, the first object being to render such depositories drill-proof. This is effected by “welding bars of iron and steel together and hardening them, and afterwards rivetting them on plates of iron, either in one direction or in layers across each other, and either close together or leaving small spaces between each bar; the plates with the bars on them to be rivetted inside the body and door of the safe, door, or room, or any part thereof, or the bars may be rivetted on the body of the safe itself without *the inner plate*, but I prefer the former method. Thus when

“ the drill or cutting instrument has perforated the outer casing
“ of the safe or door it will come in contact with or between
“ the steel faced bars; and thereby be broken and destroyed.
“ My reason for welding the iron on the steel is, that it may not
“ be broken into small pieces and removed, and also that it may
“ be straightened after hardening by hammering or any of the
“ well-known methods. I also render safes, chests, and iron
“ doors secure from being opened by forming a continuous inward
“ bevilled groove or rebate on the inside surface of the door, and
“ a corresponding inward bevilled projection on the face of the
“ lining, or the groove may be in the face of the lining and the
“ projection on the inside of the door.”

The space between the inner and outer casings is divided by wood or papier-maché into two or more thin chambers or spaces; the inner space is to be filled with alum and other salt, and the outer with alum and non-conducting materials. Thus on the outer chamber becoming heated the alum will liquefy, and by saturating the wood will render it difficult to burn.

Air-tight drawers or cupboards made of wood, are fitted in cases adapted to the interior of safes, for the better preservation of parchment deeds.

Describes a mode of constructing iron fire-proof doors, either for sliding or swinging on hinges fixed to suitable iron door-frames. These doors have a space between the inner and outer surface, which space may be divided into separate chambers and filled with fire-resisting composition. The walls and casings of fire-proof rooms are constructed in sections in the same manner.

The heads of the fastening bolts are strengthened, and other devices are contrived for (in the event of forcing), throwing the pressure on the door, instead of on the rim of the lock case.

[Printed, 1s. Drawing.]

A.D. 1865, March 13.—N^o 702.

HILL, HENRY.—The object of this invention is to secure the doors of safes and strong-rooms against forcible attempts to open them. This is effected “by making the door to draw out at one
“ of the sides or at the top, and slide backwards and forwards in
“ a groove made on the inner side of the safe. The edge of the
“ safe is made sufficiently thick to allow of the groove being cut

“ in it without weakening it. When the door is pushed into its place it can be locked in the usual way. The front of the door is made rather wider than the sliding-portion, and fits into a recess in the side of the safe. A handle may also be applied to facilitate the drawing out of the door when it is required to open the safe or strong-room.” The groove may either be cut in the metal sides of the safe, or formed by welding or rivetting a suitable piece thereon.

[Printed, &c. Drawing.]

A.D. 1865, March 14.—N° 714.

HODGSON, EDMUND DORMAN.—The object of this invention is to improve the fire-resisting and thief-proof qualities of safes.

To this end safes are fitted with sliding doors in the manner following :—“ The front of the safe is not left entirely open, as when a hinged door is used, but is enclosed with a front panel, in which there are two openings or door-ways one on each side, and between the two openings for a distance somewhat greater than the width of one of the openings the front of the safe is enclosed by the front panel. On the inner side of the front panel of the safe strong guides are fixed at the top and bottom, and in these guides two doors or slabs slide to close the openings in the panel; or if the doors are heavy they are fitted with friction pullies, on which they run in their guides. To uncover one of the doorways or openings its door is slid back behind the centre portion of the front panel. In order to secure the sliding doors opposite the doorways or openings blocks are employed to come in between them, so that on pressure being applied to one of the doors to slide it in its guides these blocks take the pressure, for they occupy the space provided at the centre of the front of the safe for the doors to slide in. A convenient way of working these blocks is by means of a right and left-handed screw, on turning which one block is raised and the other lowered; by turning the screw in one direction the blocks are brought into position to secure the sliding doors, and by turning it in the opposite direction the blocks are moved clear of the top and bottom of the doors.” When the blocks are in position to secure the doors, the further turning of the screw is prevented by the bolt of the lock.

The rising and falling bars may be employed in the same

manner for securing the doors of ordinary safes, and the invention generally may be adapted to the doors of strong-rooms.

[Printed, 1s. 4d. Drawings.]

A.D. 1865, March 15.—N° 728.

LOYSEL, EDWARD.—(*Provisional protection only.*)—The object of this invention is the protection of the doors of safes by what is called a movable steel wall.

“In one form of safe the body is constructed of two concentric cylinders with an annular space between them to receive the moveable steel wall before mentioned. Access is obtained to the interior of the safe through an opening of any convenient shape made in the side, and closed by a door mounted on hinges and secured by a good ordinary safe lock. This door is fixed on the inner cylinder, and acts in every way as an ordinary safe door, but access is barred to this door by the steel wall, which consists of a strong curved steel plate of suitable thickness. This plate is made to run on rollers in the space between the inner and outer cylinders, and can be moved laterally in its grooves. It is capable of being pushed on one side with facility when released from the safety bolts by which it is held in place. These safety bolts (of which there may be several) are secured by good locks, which are capable of being opened by suitable keys. For further security, an additional or outer door may be employed, and thus complete the outer cylinder, but, if desired, this additional door may be dispensed with. Sometimes it will be found convenient to place the protecting steel wall in the top or end of the cylindrical safe, and cause it to rotate on a central point, so as to expose the opening in the inner cylinder.”

“When it is required to adapt the invention to a flat surface, a lining of metal is arranged, so that a space between it and the outer metal wall may be left, in which a steel wall plate may be made to slide laterally in a straight line between the inner and outer plates as in the circular safe. An inner and also an outer door may also be employed as in the former instance, and are secured by means of suitable locks. In order to prevent the walls of the safe from being pierced with cutting tools, I propose to make them of iron, in which that kind of iron known in the manufacture as spiegeleisen is largely employed.

“ This particular kind of iron is exceedingly hard, and when cast
 “ in combination with other iron will present a surface which will
 “ be all but impervious to any of the cutting instruments usually
 “ employed by burglars.”

[Printed, 4d. No Drawings.]

A.D. 1865, March 31.—N° 903.

MILNER, WILLIAM, and RATCLIFF, DANIEL ROWLINSON.—
 (*Letters Patent void for want of Final Specification.*)—The object of
 this invention relating to the construction of safes, is to strengthen
 and effect a secure fastening between all sides of the door and the
 door-frame, so as to be capable of resisting attempts to force
 them by wedges or otherwise. It consists:—

1st. “ In the application and use of angled bars or pieces which
 “ may be made of iron or other strong metal, and either separate
 “ and in the form of angled or hooked bars, or in a continuous
 “ length encompassing the interior of the safe, and if the former
 “ they may either be secured on to the inside of the door, and
 “ project between the lock bolts and fit into apertures in the side
 “ of the safe, or vice versa, or if used in continuous lengths, and
 “ formed of ‘angle iron’ it may be secured to the door so that the
 “ projecting rib or edge of the angle iron may enter a groove or
 “ channel in the side of the safe, or lap over another angle iron
 “ secured to the inside of the sides of the safe. Also for the
 “ same purpose rods or bars having dove-tailed or T-heads may
 “ be secured to the door to enter openings of corresponding shape
 “ in the sides of the safe, and the ‘dogs’ now used near the
 “ hinges may be made curved to enter curved apertures as addi-
 “ tional prevention, and the door itself may be made slightly
 “ taper, that is, narrower at the hinge side than at the opening
 “ side, and the inside surfaces of the top and bottom made
 “ parallel with such taper form, so that in endeavouring to force
 “ the side opposite the hinges laterally from the door, the sides
 “ and door themselves form a resistance by their wedge-like
 “ form.”

2nd. Relates to fastening or bolting safes having double doors,
 the bolts being actuated by a handle, and when thrown interlocked
 by the bolt of a small lock.

3rd. “The application and use of an additional length of angle
 “ iron secured to the inside of the door plate, and bolted to the

“ sides or edges of the lock plate, which forms an additional
 “ fastening and assistant to the single rib or length of angle iron
 “ now used to encompass and secure the lock plate, the said
 “ additional portion being placed in reversed positions to that
 “ now used.”

[Printed, 4d. No Drawings.]

A.D. 1865, March 31.—N° 904.

COOK, THOMAS.—This invention relates to the construction of safes, to the formation and mode of hanging the door, and to the manner of securing it. It is described with reference to a wagon-formed safe, the door being fitted to close a circular opening in one end, and “consists in forming the door of a circular plate of metal with a circular fillet or projection at the back thereof, about one or two inches more or less, in diameter than the diameter of the door. Around this fillet I propose to cut a strong quick-threaded screw or portion of a screw to fit into a corresponding screwed hole formed in the front of the body or case of the safe; or I form two screws or portions of screws, both on the door and case of the safe, that is to say, I form a male and female screw on each, one inside the hole into which the door fits, and the other outside of said hole. I also form a screwed hole through the center of the door, and fit therein a screw, the outer screwed end whereof passes through a screwed hole formed in one end of an iron arm, the other end of said arm being hinged to the outside of the body of the safe, so that as the said door is turned round by means of a suitable handle for the purpose of opening the door (for example), the screw aforesaid passes along the screwed hole in the aforesaid hinged arm, and thus allows the screw on the door to move parallel to the hinge until the door is open, when it may be turned on its hinged arm; a reverse movement will close the door. The door of the safe is intended to be fastened by any approved kind of lock.”

[Printed, 10d. Drawing.]

A.D. 1865, April 4.—N° 946.

THOMPSON, GEORGE CURR.—(*Provisional protection only.*)—
 The object of this invention is the adaptation of screws to the
 s. D

purpose of fastening safe and other doors. These screws are mounted in suitable bearings fixed to the inside of the door, severally in such radial positions that their screwed or outer ends point in different directions laterally towards holes in the frame or front margin of the safe, into which frame the door fits when closed, the holes in the frame being tapped with screw threads to receive the ends of the screws, which are all caused to rotate by means of a central tooth or worm wheel disposed inside the door, the wheel being free to turn on an axis when moved round by a key, and the shaft of each screw having teeth or worms, engage with the teeth or worms of the wheel. By this means all the screws are driven simultaneously into the surrounding frame, and "will defy all wrenching to separate it (the door) from the sides of the structure to which it is applied."

Other devices for actuating the screws may be contrived, and when the screw ends are screwed home in the holes in the frame, the wheel or other actuating apparatus is to be secured by an ordinary lock.

[Printed, 4d. No Drawings.]

A.D. 1865, April 7.—N^o 1000.

SKIDMORE, THOMAS.—The object of this invention relating to the construction of safes is so to strengthen the parts that form the door-frame, as to interpose an obstacle to the insertion of wedges, and also to protect the parts which hold the fastening bolts when thrown. To this end (as described by the inventor) "I first mitre round the inside of the safe strong angle iron of about 3 inches wide, the angle iron not being cut through at the corners, sufficient only being cut out to admit of bending it and make it mitre. This angle iron which forms an inner framing is tenoned into the body of the safe in two parts, which join half way down the side of the safe, and it is firmly secured to the safe all round. A frame of solid iron about 3 inches by 1½ inch is dovetailed together and placed on the angle iron, which is tenoned into it as above mentioned. The angle iron framing and the sides of the safe are thus firmly secured together, and on this is placed a steel plate which fits into a groove in the body plates of the safe one quarter of the way through, and is made flush on the inside with the plate 3 inches by 1½ inch. On the front of this a plate of quarter inch iron

“ is fixed, so as to form with the steel a rebate all round the safe.
“ The whole of this is firmly screwed and rivetted to the angle-
“ iron and body plates. The door of the safe is also rebated so as
“ to fit the inner rebate of the frame before mentioned; it will
“ therefore be evident that by inserting wedges anywhere round
“ the edge of the door, the wedges will come in contact with the
“ hardened steel and cannot be driven in. The front of the safe
“ will also be so strengthened by the strong iron frame that it
“ cannot be forced out by wedging.”

The door is made drill-proof by the use in its construction of plates of hardened steel.

[Printed, 8d. Drawing.]

A.D. 1865, April 12.—N° 1045.

HART, JOHN MATTHIAS.—This invention relating to the protection of safe and other doors, is designed with a view to more effectually obtain, safety and security, it being a compound system of bolts and bolting combined with locking apparatus. The principal fastening bolts are actuated by a handle or knob on the main spindle, which also carries two or more followers or radial arms, that severally act in succession, not only to project or withdraw the bolt plate or plates, which carries or carry the main bolt heads, but also by a continuous movement, to bring into position one, two, or more abutment plates, which obstruct the return movement of the main bolts, such abutment plates being detained or rigidly fixed in their obstructive position by the bolt of the safe lock, the tumblers or levers whereof have one or two series of gatings or openings to receive and act conjointly with one or more series, respectively of fixed or stationary, and movable or travelling stumps; the invention being susceptible of considerable modification (four of which are described and illustrated) may be regarded as a fair specimen or example of a compound system adapted for throwing the main bolts (which secure the safe door) by hand, and afterwards fixing them in their thrown position by abutment plates, which in turn are subsequently stopped by the bolt of the safe lock.

A more detailed description of the principle on which the different modifications operate, will be found in the series of Abridgments relating to “Locks, Latches, Bolts, and similar Fastenings.”

[Printed, 4s. 8d. Drawings.]

A.D. 1865, April 13.—N° 1056.

CHUBB, JOHN, and GOATER, ROBERT.—(*Provisional protection only.*)—This invention relating to the construction of safes and strong rooms has for its chief object the strengthening of the holdings which receive the ends of the main fastening bolts. For this purpose “in constructing the door and the parts of an iron safe or strong-room into which the door shuts, there are formed or fixed around the door and on its interior surface a series of projections, through which are openings or passages coinciding with the bolts in the lock. On the interior of the safe or strong room where the door is received there are other projections with openings through them through which the projections on the inner surface of the door pass. Through each of the openings in the projections on the door a bolt of the lock may be made to pass when the bolts are shot or locked, the bolts passing at the back of the projections on the interior of the safe or strong room; by this means the projections upon the door are prevented from being drawn out from the openings through the projections on the interior of the safe or strong room. The projections on the door and the interior of the safe or strong room are made strong, and by preference of steel, and will be most effectual in preventing the door being opened, or the sides or ends of a safe or strong room being caused to bulge outward by the use of wedges or otherwise, In some cases, in place of having two sets of separate projections, one of the sets may be composed of strong bars, with openings through them corresponding in positions with the detached projections; in all cases these parts are made strong, and by preference of steel. In some cases a strong tongue is fixed all round the door projecting from its inner surface, and on the interior of the parts of a safe or strong room where the door is received when shut there are other bars or projecting tongues which come inside the projecting tongues or bars on the inside surface of the door so as to form a groove or channel all round the doorway to receive the projecting tongue or bar around the door, by which means the sides of an iron safe or strong room cannot be caused to bulge out from the edges of the door by driving in wedges, the sides being securely retained from being bent outwards by such tongues or bars. It is preferred that these tongues or projecting bars should be con-

“tinuous all round the inner edge of the door, but such tongues
“may be applied at intervals only.”

[Printed, 4d. No Drawings.]

A.D. 1865, June 20.—N° 1657.

PARRISH, JAMES, THATCHER, CHARLES, and GLASSCOCK, THOMAS.—The object of this invention, relating to the construction of the door and door-frames of safes and strong-rooms, is to prevent the forcing open the doors of such receptacles by means of wedges. To this end at intervals along the top, bottom, and two sides of the door-plate is formed a series of dovetail projections, which, when the door is closed, fit exactly into a corresponding series of dovetail recesses cut out of the solid metal of the door-frame. The door and also the frame is lined with plates of hardened steel for the purpose of resisting the action of drilling or cutting instruments.

[Printed, 10d. Drawings.]

A.D. 1865, July 22.—N° 1911.

DIAPER, WILLIAM.—This invention has for its object the construction and security of safes. To this end, for the purpose of strengthening the door and the door-frame of safes and similar depositories, in order to afford more effectual resistance when attempts are made to open them by means of levers or crowbars, the flange round the inner body of the safe and the frame of its shell or outer case is formed respectively of one single piece of double angle iron (**Z**) which is rivetted to the plates, instead of employing for this purpose, as heretofore, single angle iron, and the same kind of double angle iron is employed to form the sides of the lock case, there being a packing piece between it and the inner surface of the door to increase the width, so that the rivets pass direct through the flange of the angle iron, the packing piece, and the door plate. Also into these three surfaces are screwed a regular distance apart a number of strong studs, which project inwards, and when the door is closed, they pass through the plate of the double angle iron which internally surrounds the door frame, and which is secured by one flange to the front edge of the safe; the bolts of the lock when shot pass through the other flange of the angle iron, and engage in notches *formed near the ends of the studs*,

In order to render it more difficult to cut a hole in the door or body of a safe by means of drills or other boring instruments, the inventor inserts "between the outer and inner plates of the door and body of the safe, cylindrical steel rods placed closely side by side, so that when a hole has been cut in the outer plate the round surfaces of the rods shall not enable the drill or other boring instrument to take a fixed hold, and will thus prevent its action."

[Printed, 8d. Drawing.]

A.D. 1865, August 2.—N° 1995.

ANDREW, THOMAS, and TAYLOR, JAMES WHILEY. — (*Provisional protection only.*)—The object of this invention, relating to the construction of the doors, and to fastenings adapted to the doors and cases of safes and strong-rooms, is to prevent their being opened by wedges and levers.

"For the purposes of this invention" the door is formed hollow with solid or thick edges. Through the center of the door is fitted a short axis whereon, inside the cavity of the door is fixed a toothed crown wheel, and on the end of the spindle outside the door is securely fixed a suitable knob or handle for the purpose of turning it. When set in motion the crown wheel imparts rotatory action to four pinions, respectively fixed on the contiguous ends of four spindles which are radially disposed relatively at right angles inside the door, and mounted to revolve in suitable bearings or sockets. The outer ends of these spindles are screw-threaded; they pass through screwed holes in the flanges of the door, and when set in motion, the door being closed, they enter corresponding holes in the front part or portion of the safe which forms the door frame. The whole of this arrangement of wheels and screwed spindles is fitted inside the hollow casing or cavity of the door. Instead of four a greater number of screws may be employed, and the lock used, may be of any approved kind, and must be suitably fitted and arranged to so interlock with the mechanism, that the handles will have no power to turn the spindles until they are set at liberty by the key.

[Printed, 4d. No Drawings.]

A.D. 1865, August 2.—N° 2006.

ALLMAN, HERBERT. — This invention relates to the construction of cast-iron burglar-proof safes.

1st. These safes may be either cylindrical, square, polygonal, or other convenient form, and for the purpose of making them present an external surface so hard that it cannot be operated upon by drills or cutting tools, they are cast in metal moulds, so that all the entire surface of the outside, and all the parts that come into sudden contact with the cold metal that constitutes the mould, are suddenly chilled and thereby so hardened as to be capable of resisting all burglarious efforts to pierce them.

The safes may be cast in one piece, or in parts or sections to be afterwards connected together in any suitable manner, as well understood by the trade.

2nd. "Relates to the manner of forming the door or closure; this I construct so as to slide in a groove, and I form it of less depth on one side than the other, that is to say slightly wedge-shaped, so that when run forward it fits on three sides in an undercut rebate or groove, and when run back it stands clear of such groove, and is capable of being turned on its hinge or joint."

"By this arrangement the safe cannot be opened unless the door be first drawn back (moved laterally) out of the groove, and then it can be turned on its hinge. To prevent its being drawn out of the groove, the lock of the safe shoots one or more bolts at right angles to the sliding motion."

3rd. "In fixing a safe by bolts, I prefer to put on the nuts inside the safe, and thereby prevent their exposure."

[Printed, 4d. No Drawings.]

A.D. 1865, August 11.—N° 2081.

KJELLBERG, PETER CARLSSON.—This invention is designed for the protection from fire, of papers, books, money, and other articles of value in safes and depositories. To this end the safe is suspended by means of hempen or other rope made of ignitable material capable of combustion, over a vertical hollow shaft, tube, or cylinder, corresponding in size to the horizontal sectional configuration of the safe, the bottom of the safe being slightly within the upper part of the shaft, in order that when a fire takes place the rope may ignite and burn, and when no longer capable of supporting the safe the latter may fall to the bottom of the shaft, there to remain in safety until it is removed after the fire is extinguished or burnt out. The cover of the shaft or tube is placed

in position either upon or above the top of the safe, or as an open trap, so that when the safe descends, the trap or cover may fall into its place and effectually close the open or top end of the shaft.

The safe could if desired be lowered for safety into the shaft or tube each night, and the lid or cover being secured by suitable bolts and locks, would serve as an additional protection against burglars.

[Printed, &c. Drawing.]

A.D. 1865, August 17.—N° 2121.

PHILLIPS, SAMUEL, and GROVES, JOSEPH.—The object of this invention, relating to the construction of safes, is to render them perfectly secure against the action of wedges. It is described first as applied to “‘belted’ safes. On the inside of the bar of “ which the belt consists we form a projecting flat rib, which is “ parallel with the edges of the bar, the rib being rolled in one “ piece with the bar. The outer door will then shut down upon “ the outer edge of the rib, and upon the said rib an iron plate “ is rivetted. . . . The edge of this plate is not flush with “ the edge of the rib, but stands a little further back than “ the said rib so that the rib and plate will form as it were “ steps or projections inside the safe, but parallel with its edge. “ Against the inner step or projection the inner door of the safe “ shuts, the outer door of the safe coming against the outer step “ or projection. The edge of the inner door has a series of dovetails (which may be of any convenient number) formed upon it, “ or otherwise secured to it, and the plate against which the said “ inner door shuts being provided with dovetail grooves to correspond, the dovetails take therein when the door of the safe “ is closed. We also rivet through the inner door strong “ wrought-iron pins or bolts, which are received upon bed-plates “ of angle iron affixed in the sides and ends of the safe, so that “ when the door of the safe is closed, the said pins or bolts take “ in the cavities provided for them in the bed plate, and assist “ the dovetails in holding the sides and ends of the safe firmly “ together. On the edge of the inner door we also rivet strong “ bolt receivers, which are in the shape of catches or staples; “ these are protected by a steel covering, and when the door of “ *the safe is closed* insert themselves between the second of the

“ steps or projections . . . and the outer plates of the safe, so assisting the holding pins of the lock case to resist the effect of “ a wedge or chisel inserted with a view to force open the safe.”

As applied to unbelted safes, the dovetails on the inner door are made to engage in corresponding recesses made in the inner plate, the rib before described being dispensed with.

The hinged edge of the door, to prevent the insertion of wedges, has the angles taken off and made half round to fit (when the door is closing) into the half round groove sunk in the door frame.

Compound angle iron is used for the angles and corners, the edges of the plates which are rivetted to the main flanges being chamfered to abut against the outer angle piece of the iron, which is correspondingly undercut.

[Printed, 8d. Drawing.]

A.D. 1865, September 2.—N° 2265.

CHATWOOD, SAMUEL.—The object of this invention, relating to the construction of safes of cast iron by two separate operations, is described as follows :—

“ I run into moulds of the required form for safes or parts of safes for strong rooms or parts of strong rooms, and for doors “ or parts of doors any hard or brittle metal, and produce castings having projections, or indentations, or holes, or perforations “ of any form or shape on or in those parts intended to be coated “ over with, or cast on or surrounded with soft or ductile metal “ which is cast on the hard or brittle metal in a molten state and “ in suitable moulds for the purpose.”

“ The arrangement of the metals may be hard or brittle inside “ the safe, room, or door, and soft or ductile outside, or the “ reverse, also soft or ductile metal between hard or brittle metal, “ or hard or brittle metal between soft or ductile metal.”

“ To prevent detrimental strain by the contraction of the metal “ cast on the other metal, I take the first casting as soon as the “ metal is set and while it is still in a hot state, and place it in a “ mould prepared for it, and run the other metal in a molten “ state upon it, so that when they cool together the tensile property of the last named-metal will not be much decreased in “ any of its parts or fractured by contraction.”

“ The metals I prefer for the hard or brittle castings, before-named, are compounds of iron and carbon or steel; of iron,

“ safe and the inner lining ; this space is to be filled with water by means of a supplying pipe fitted and screwed to a hole on the side of the safe ; this pipe will let in water from the street or any other place, but the cistern ought to be outside of the house. The supply pipe may be provided with a cock, so that in case of fire, water may be let into the empty space surrounding the safe, but no water should be let into the space except in case of fire. An overflow pipe is fitted to the water space, so that while the water is turned on there may be a continuous flow of cold water through the safe, and thus the interior may be kept comparatively cool.”

It is stated that it is unnecessary to admit the water flow to supply the space in the lid or door, but if thought advisable to do so in the case of a vertical door, the space “ may be filled by hand through a hole in the top and kept constantly charged.” The inventor further states that “ the thinnest writings, notes or any other things contained in a safe constructed in the manner above described, would remain unhurt therein with the fiercest fire raging around it, even if the fire entirely enveloped the safe.” The manner in which under such circumstances the cavity in the door is to be kept filled by hand is not described.

[Printed, *ed.* Drawing.]

A.D. 1865, December 23.—N° 3321.

CHATWOOD, SAMUEL.—This invention relating to the casting of the bodies and doors of safes and similar depositories, and the doors and door-frames of strong-rooms, refers chiefly to the composition of the metal suitable for the purpose, and to the moulds employed, the object being to obtain strong, tough, and to some extent malleable metal from mixtures of cast-iron, and wrought-iron or steel, which will bend rather than break or fracture under the blows of a hammer.

“ The following are some of the mixtures suitable for the purpose :—Cast-iron (from the hematite ores preferred) and steel, in equal parts, with the addition of three per cent. of manganese ; cast-iron (from the hematite ores preferred) and wrought or malleable iron, in equal parts, with the addition of one per cent. of titanium ; malleable or wrought iron and steel, in equal parts, with the addition of three per cent. of manganese and one per cent. of ferrocyanide of potassium ; cast-iron (also

“ from hematite ores preferred) eighty per cent. and oxide of iron
“ twenty per cent. I also use iron produced by the reduction of
“ the anhydrous peroxide of iron to the metallic state, which is
“ nearly pure ferricum.”

In order that the moulds employed may be capable of withstanding the high degree of heat necessary to render the mixed metals fluid, compositions are used mainly composed of ganister or silicate of alumina, or other compounds commonly employed when casting steel. The mould after it has received the casting may, if deemed advisable, be placed in an annealing furnace to increase the malleability of the metal. Moulds are also used having those internal surfaces with which the molten metal comes in contact, coated with oxide of iron which is dusted over with ground coal or shale to prevent the adhesion to the casting of the metallic oxide, the use of which it is stated, renders cast metal more ductile than it would be if cast in the ordinary way.

[Printed, 4d. No Drawings.]

A.D. 1865, December 23.—N^o 3324.

GROVES, JOSEPH and ROBINSON, GEORGE, the younger.—(*Provisional protection only.*)—The object of the first parts of this invention relating to safes, is so to fit and strengthen the edges of the door, and of the front part of the safe or door-frame, as to prevent the introduction of wedges and render attempts to force them open by such means abortive. It consists in:—

1st. For the purpose of preventing the introduction of wedges between the edges of the door of a safe and the front edge of the body or door frame, fixing projecting pieces of metal to the inside margin of the door, at the top, bottom, and the side opposite to that to which the door is hinged, and forming corresponding recesses in that surface of the top, bottom, and corresponding side of the door-frame against which the door closes, so that the several projections on the door enter the several recesses in the door-frame when the door is closed, and in this position the lateral forcing of the door-frame is prevented.

2nd. “ Making the front part of the open side of the safe
“ against which the door shuts, of plates or bars of iron or steel
“ made of an inverted trough shape with flanges, or of the shape
“ of the ordinary bridge rail. The said trough-shaped plates
“ are rivetted by their flanges to the outer plates of the safe, and

"constitute a hollow projecting rib running all round the open front of the safe. When the door of the safe is closed it shuts against the side of the said hollow rib, and the bolts of the door engage with the summit of the said rib to fasten the door. The said inverted trough-shaped plates or bars are made by rolling."

3rd. "Making a square or angular groove or depression near the edge of the side plate of the safe to which the door is hinged, into which groove the edge of the inner steel door of the safe enters when the door is shut. The introduction of a chisel or instrument between the joint of the door and side of the safe is thereby prevented."

The latter part of the invention relating to the protection of the locks and fastenings, with a view to prevent the introduction of gunpowder or picking instruments, is more particularly described in the vol. of Abridgments relating to "Locks, Latches, Bolts, and similar Fastenings."

[Printed, 4d. No Drawings.]

1866.

A.D. 1856, January 11.—N^o 96.

RUDLING, WILLIAM ATKINS.—(*Provisional protection only.*)
—The object of this invention is the protection of property generally from the depredations of thieves or otherwise, by means of a system of electrical communication, passed through insulated copper wires disposed in main pipes laid under the streets, and conveyed to a suitable office or station, wherein is an alarm bell to arrest attention, and an indicating dial to discover whether the danger be from thieves or fire. The apparatus is first described as applicable to detect the forcible entry of thieves to a safe or a strong-room. The safe is to be set on solid masonry and held down by bolts, the heads whereof are held in the masonry, the nuts or cotters being inside the safe, which is connected to the main pipes in the street by a strong chilled cast-iron small-bore pipe, whereon the communicating wire is deposited. Disposed either inside the safe or beneath it in the masonry is a galvanic battery, and the commutator which is described in detail, is attached to the floor of the safe. When the door of the safe is

closed, the circuit between it and the station is complete, but when opened the current ceases to flow, and the bell is rung by the de-magnetisation of an electro-magnet, that has held the detent which when free liberates a catch. A variety of plans are devised for otherwise breaking the current, such as the weight of a person walking over a spring flooring board, wire stretched across passages, etc.; a full description of the station-indicating dial is given.

Three methods of constructing calorimeters adapted to give signals in cases of fire, are also described.

[Printed, 4d. No Drawings.]

A.D. 1866, February 21.—N° 541.

DEAKIN, WILLIAM.—(*Provisional protection only*).—The object of this invention relating to the construction of metallic safes, chests, strong-rooms, deed boxes, and similar depositories, is entire security against forcible attempts to open them; and to this end it consists in:—

1st. "Forming a groove around the inside of my door, sufficiently from the edge to allow of a proper thickness or substance of metal to resist displacement but by actual destruction."

2nd. "Forming a projecting rabbet or fillet around the outer edge of my door, which fitting into a corresponding rabbet prevents the insertion of wedges at that part."

3rd. "Combining the seat for the door in such a manner that the inner portion bears against the side and top of such receptacles to which it may be applied by rivets, screws or other means, and fitting on the edge of the sides and ends with a dovetailed joint, so as to prevent the insertion of wedges or other appliances at the connection between the said seats and sides or top of the receptacle. And further the said seat is so formed that a solid fillet is provided for fitting into the groove on the inside of the door, while the seat is also extended to form the double rabbet corresponding with the rabbet on the edge of the door before referred to. The corresponding rabbet on the edge of the door with the sunken groove before referred to and the surrounding parts form what may be technically called the stiles and rails of the door, and which parts are also provided with an extended flange and double rabbet or dovetail for the purpose of receiving the door panel or centre part, which is

“ secured to the said stiles and rails by bolts, screws, rivets, or
 “ other appliances going through the said flange, and wholly or
 “ partially through the panel. The . . . bolts may be made to
 “ enter corresponding cavities formed in the inner flange of my
 “ before-described door seat, which with the rim of the door I
 “ propose making of steel, and thereby capable of being hardened
 “ and tempered, or of iron or the homogeneous metal known as
 “ Bessemer’s steel, and by preference I adopt such a section as
 “ will admit of producing bars of metal for giving effect to my
 “ improvements by the process of rolling. . . . Instead of forming
 “ the solid fillet for fitting into the groove of the inside of the
 “ door of and with the door seat the same may be formed of the
 “ sides and ends of the chest or receptacle.”

[Printed, 4d. No Drawings.]

A.D. 1866, February 23.—N^o 552.

HADDAN, JOHN COOPE, and HADDAN, HERBERT JOHN.—
 The object of this invention is the construction of safes capable of
 resisting the action of wedges when applied to force or bulge out
 the door-frame.

Safes according to the invention may be made either spherical,
 elliptical, or partly straight and partly curved. If made cylindrical
 with a flat end in which the door is fitted, the circular form of the
 frame would not permit of its being forced outwards unless the
 metal actually stretched, which is not likely to be the case. The
 door instead of occupying the whole of one end, may be made
 comparatively small, occupying only a portion, and the interior
 casing of the safe with its several compartments, may be made to
 revolve or move, and thus bring or place in position either of the
 compartments, so as to be accessible through the small door, and
 this arrangement may be reversed by making the inside a fixture
 and the outer shell or body to revolve. In some cases the door
 may occupy a position at the side of a cylindrical safe, and other
 modifications within the limits of the invention may be adopted,
 the objects sought being “ the casting or constructing safes of a
 “ hollow, spherical, spheroidal, ellipsoidal, or any other similar or
 “ analogous curved form or any faced figure generally following
 “ any such curved form or generally of any of the said forms, but
 “ having flats or faces upon them for access, door, or opening, or
 “ *for base to stand upon or otherwise; or the door cap or cover*

“ may follow the form of the general figure. In any of these cases the generally curved form of the figure will tend to secure a flush fitting door.”

Transverse tie rods either fixed or removable may be employed, and the doors may be hinged either to the case or door-frame, or when double doors are employed, to a central bar or pillar. The ends of the lock bolts and the recesses made to receive them in the door-frame, may be bevelled for the purpose when the bolts are thrown of bringing the door close home to the frame; the perimeter of the door if circular may be conveniently turned slightly conical, and an annular or other formed rib round the inside of the door, may be made when the latter is closed to fit into an annular or other shaped recess in the frame, so as to constitute a lateral tie; sliding dovetails may also be employed to secure the door to the door-frame.

The invention also comprises the vitrifying or glazing of the exterior of safes, as a precaution against drilling or cutting.

Amongst a variety of other details is exhibited a twin cylinder safe, the doors being on crane brackets.

[Printed, 1s. 2d. Drawings.]

A.D. 1866, March 2.—N^o 641.

TANSLEY, JAMES.—The object of this invention is to construct safes which shall effectually resist the attempts of burglars to open them by means of wedges, levers, or other instruments. To this end as stated by the inventor “ I propose to fit safes with inner and outer doors so constructed that the outer doors will lock into the face of the inner doors, and thus, if wedges are used to thrust out one of the sides of the safe to free the bolts carried by the outer door, the inner door being attached to the side that is being subjected to the strain of the burglars’ wedges will assist the side attacked to resist the strain put upon it, or, in other words, will hold the side and the outer door firmly together. On the inner face of the outer door I form parallel ribs in a line with the hinges, and on the outer face of the door I make similar ribs to fit into the recesses formed by the ribs of the outer door. By preference I use a pair of folding doors for the inner door, but when I use a single inner door I hinge it on the opposite side to that of the outer door. When therefore a lateral strain is put on the side of the safe the inner door will

“ through its hinges take that strain and transmit it to the outer door. It will thus be seen that so long as the inner hinges are able to withstand the attack the side of the safe cannot yield to the strain of the wedges forced between it and the edge of the outer door. To prevent the prising of the top or bottom of the safe I form the top and bottom plates with a fillet, which fits into transverse recesses made on the inner face and near the upper and lower edges of the outer door. The door will therefore when shut interlock with the top and bottom plates, and enable them to resist the lateral strain of wedges driven in between them and the door. This arrangement of interlocking doors applies also to the windows and doors of strong rooms.”

It is also proposed to fix the safe upon a table mounted on a central vertical axis free to turn in a hollow pillar that rests upon and rises from the basement, the object being to afford a burglar no purchase for a crow-bar or other forcing instrument.

[Printed, 10d. Drawing.]

A.D. 1866, March 3.—N° 648.

HOSKING, ALBERT.—(*Provisional protection only.*)—This is an invention of a detector apparatus, designed for the protection of safes, and consists in establishing a visible signal communication between the safe and an instrument attached to the window or conspicuous part of the front of the shop, warehouse, office, or other premises wherein the safe is used.

The main feature of the invention is the employment of signal lights so arranged as to be strikingly visible from the exterior of the building, certain conditions of which lights represent at all hours the state of the safe. This is effected by means of a lamp having three bull's-eyes, two of which are of coloured glass; behind each bull's-eye an ordinary gas burner is placed, and behind each burner a powerful reflector. Intermitting rays from the outer (colored) bull's-eyes are obtained by the employment of ordinary clockwork machinery, which lowers and raises the flame or light behind each bull's-eye thirty times a minute, thus affording sixty alternate streams of light from the two. The clockwork gives motion to two ordinary gas taps or cocks which supply gas to the two outer burners respectively. The relighting is effected by introducing into the pipe just below the burner an independent stream of gas, which stream

“ is in no way dependant on the revolving taps, nor is it in any way effected by it. The result is that when the gas is entirely cut off from the burners by the revolution of the tap the smaller stream admitted below the burner keeps up a minute flame which ignites the full stream of gas released by the revolution of the tap. The existence of these intermittent lights in conjunction with the third (and steady) light indicates the security of the safe, and contrarily the extinction of these lights will constitute a signal of danger. That portion of the apparatus placed within the safe is of the simplest character, and occupies so little space that the ordinary arrangements of a safe are not interfered with. It consists of a spring placed within a tube passing through the bottom of the safe, and having direct communication with the lamp by cat-gut, which passing around the gas tap within the lamp causes on the release of the spring the instant extinction of the three lights followed immediately by a prolonged glare of magnesium light obtained by use of magnesium wire fed forward by rollers and ignited by a fourth and independant jet of gas. The cat-gut communicator is conveyed through a steel tube, which is itself enclosed within the gas tube supplying the burners within the lamp, so that any attempt to disarrange the apparatus would but precipitate discovery.”

[Printed, 4d. No Drawings.]

A.D. 1866, March 6.—N° 685.

CHUBB, JOHN.—The object of this invention is to improve the construction of safes and strong-rooms.

“ For these purposes in order to give greater strength to the framing which surrounds the door of an iron safe or strong-room, and also for preventing the sides of an iron frame giving way if wedges or other instruments are forced in between the door and the frame, a tie bar or bars is or are used across the doorway internal of the safe or strong room, by which the sides are tied to each other. These tie bars may in some cases be fixed to the two sides of the safe or frame of the door, but generally they will be moveable, in which cases the ends of the tie bars are formed with dovetails or enlargements which fit into corresponding recesses at the sides of the frame of the door, and are retained in position at the back of the door when it is closed.”

The invention also "relates to the plating of safes and strong rooms. When the doors and sides, the tops, and bottoms, and backs of iron safes are each made of two or more plates, one being of hard steel, these plates are fixed together by screws, the heads of which are on the inner surfaces, and the screws only enter into but do not come through to the outer surfaces. Rivets also may be employed in conjunction with screws or otherwise for fixing the plates together."

It also "relates to the pivots or axes of the door of a safe or strong room and the carriages or sockets in which the same are supported. In order that it may not be possible to wrench off the carriages or sockets from the door frame, of which they form part, by forcing the upper and lower carriages apart by wedges, levers, or otherwise, I make the surfaces of the carriages inclined so that any lever or instrument thus applied may slip off and not obtain any effective bearing and purchase; a further security is obtained by enlarging the axes so as to cover the faces of the carriages." One of the carriages is forged in one piece with the frame, and both of the carriages and the pivots should be of either case-hardened iron or tempered steel.

[Printed, 1s. Drawings.]

A.D. 1866, March 7.—N^o 694.

PRICE, GEORGE.—The object of this invention is so to improve the construction of safes by strengthening the angles and the mid-length of the sides forming the door-frame, as to render futile any attempt made to open them with wedges or crowbars.

1st. Forming the "opening for the doors of wrought-iron safes, chests, or strong rooms out of boiler plate of any required thickness by cutting out a piece of such plate the exact size of the opening required for the door, leaving around such opening a width of the plate of not less than three inches. This plate so prepared is dovetailed to the front edges of the four plates forming the four sides of the safe, and rivetted to angle iron inside all round the front in the same manner as is now usual in fastening the body plates together."

2nd. Shaping the edges of the door-plate to such form as will leave one or more transverse dovetails or projections on each of the four sides, corresponding recesses being formed at intervals in the four sides of the plate which is cut out to form the door-

frame, so that when the door is closed, the projections fit into the dovetail recesses and prevent the lateral separation of the parts by attempts to force an entrance with any burglarious instrument.

3rd. Instead of dovetailing or jointing at the angles as heretofore the four front iron strengthening bars which form the door-frame, two pieces of bar or plate iron of the required width and thickness are right angularly bent down about six inches at the two ends to form the two top and two bottom corners, and the upper and lower parts, and two other straight pieces are dovetailed into the bent ends and form the sides; this frame is fitted inside the entrance flush with the front of the doorway, and is fixed to the sides by rivetting; within this frame is fixed another frame of similar construction, its outer edge or face being rebated to receive the inside marginal edges of the door plates.

4th. Fastening to the "back of the door plate about half way up, " a link or links made of, say, half-inch square iron, and formed " so as to leave an opening at each end of about one inch in " diameter. In the act of closing the door this link at each end " hooks on to a stud or hook securely fastened to each side of " the interior of the body of the safe. This stud or hook may " be formed on a bracket rivetted to the body plates, or shaped as " a hook with a plate and rivetted or screwed to the body plates."

As a further security, two welded straps are shrunk on outside round the sides, one flush with the front, and the other flush with the back. The angle pieces, bars, links, and studs, are either to be of iron case-hardened or of hardened steel.

[Printed, 8d. Drawing.]

A.D. 1866, March 9.—N^o 717.

MOXON, THOMAS BEWSHER.—(*Provisional protection only.*)—This invention is designed as a protection to safes, the object being to render such and other depositories more secure.

It consists in arranging and disposing " within the interior of " the safe or other convenient place an electric battery, from one " of the poles of which an insulated wire is conducted to any " convenient or desired place. This wire is caused to take a " winding or serpentine course along and throughout the sides " of the interior of the safe, forming thereby a cage, which may " be imbedded for insulation in suitable cement or gutta percha. " From the opposite hole of the battery another wire is con-

“ ducted so as to form a connection with the aforesaid wire, so
 “ that when the safe door is closed, the electric current between
 “ the poles of the battery is complete, and in such condition the
 “ current will suspend a magnet arranged in any position or place
 “ upon the conducting wire, but should the wire be severed or
 “ disconnected, and the electric current broken, the said magnet
 “ is no longer held in suspension, but is caused to drop on to
 “ the end of a lever, and by the weight of such magnet imme-
 “ diately sets in motion an alarm, thereby giving notice that an
 “ attempt has been made to open the safe ; the interstices of the
 “ wire cage within the interior of the safe are sufficiently small
 “ to preclude the possibility of any instrument being inserted
 “ without destroying the electric current.”

[Printed, 4d. No Drawings.]

A.D. 1866, March 13.—N^o 754.

JESSOP, JOSEPH, and Warburton, William.—This invention relates to the doors or covers, and the doorways or frames of safes, strong rooms, and similar depositories, the object, as described by the inventors, being to “prevent or render difficult the introduction of wedges, chisels, or other such means for the forcible opening of the doors or covers of safes, strong rooms, and other receptacles of property. For this purpose, in place of the edge or that surface of such door or cover which closes into or upon the frame thereof, being formed straight or of a series of straight lines simply, fitting close one into or upon the other, as is the usual manner, we form the edge around the door or cover, and the surrounding frame thereof, with a series of short corrugations, serrations, or teeth, those of the door or cover fitting closely into those of the surrounding frame.”

Four examples are shown in the drawing. The first consists of a series of pointed teeth formed crosswise on the edges all round the door, which fit when the door is closed into similar shaped teeth formed on the inner edge of the door-frame ; the second example shows a series of round teeth which fit into correspondingly-formed recesses in the frame ; the third exhibits a series of square teeth, and in the fourth the teeth are made half round, and the recesses into which they fit in the door-frame are *concave*.

[Printed, 10d. Drawing.]

A.D. 1866, March 17.—N° 792.

SAGAR, THOMAS, and KEIGHLEY, GEORGE.—The object of this invention, relating to the construction of safes, is to render them proof against the wedges, crowbars, and instruments of burglars. To this end, instead of adopting the ordinary rectangular form, these safes are made of wrought iron or steel plates so rolled, bent, or shaped as sectional parts, as when joined together they produce either a cylindrical, elliptical, or spherical form. The several sections may be united either by welding or otherwise, and the entrance is made and the door fitted thereto in the most convenient part. The outer shell of these safes is lined with plates of chilled cast iron, and they have an internal metal casing, the intermediate space between which and the lining of the outer shell is filled with any suitable fire-resisting substance. The internal marginal edge of the door is so grooved as to leave a projecting bead all round, which fits in a groove formed round the door-frame when the door is closed, and the groove round the door is filled by the bead formed round the door-frame, so that there is no direct passage for driving in the end of a wedge or other burglarious instrument. As a further protection the outer shell is case-hardened.

[Printed, 6d. Drawing.]

A.D. 1866, March 17.—N° 799.

HINTON, FREDERIC.—This invention relates to the construction of safes designed for the reception and security of valuable property, and to the mode of fastening adapted to secure them. It “consists in constructing such safes (made by preference “cylindrical or otherwise circular in form) with a circular opening or mouth capable of being closed by means of a corresponding circular disc or cover of suitable strength fitting into “and flush with the mouth, and supported therein against or “upon a ring or collar formed with or attached to the safe, and “made by preference with one or more ‘set-offs’ or depressions “which the cover is correspondingly formed to fit. Formed with “or securely attached to the under side of the cover are three or “any other convenient number of lugs or ears, which in closing “the safe pass through corresponding spaces formed in the ring “or collar, but upon the cover being subsequently partially revolved, pass beneath the solid portions of the ring or collar.

“ and thus (while they remain in this position) prevent the removal of the cover from the safe. The cover may be revolved to the extent necessary for either locking or removal (and which is limited by suitable stops) by one or more studs or handles fitting into the keyhole or keyholes of the cover, or by any other convenient or suitable means.” The manner in which the lock of a safe is attached to the under side of the door or cover, and protected by a guard plate, will be found more particularly described in the series of Abridgments relating to “ Locks, Latches, Bolts, and Similar Fastenings.”

“ It will be obvious that the construction of safes with circular covers or doors, substantially in the manner described, and also that the arrangement and form of the lock and key may be variously modified, as, for example, the mouth or opening into the safe may be retained of the circular form, and the body of the safe itself may be made square or of any other convenient form and may be placed either vertically or horizontally as found most convenient for the purpose required. The cover also may be moved by various means other than those described, according to its size and weight.”

[Printed 10d. Drawing.]

A.D. 1866, March 27.—N^o 895.

BRACHER, JOHN.—(*Letters Patent void for want of Final Specification.*)

This invention relates to the use of **T** iron and variously formed double and triple angle iron prepared in the rolling process for the construction of iron safes, strong-rooms and doors, the object being to render safes, and strong-rooms, thief-proof by increasing the strength without materially augmenting the weight. For the corners of safes a kind of double angle-iron is employed having relatively at right angles two longitudinal recesses respectively to receive the edges of the plates which form the sides.

Safes having single doors have the door-frame made of **T** iron ; the flange is placed outwards, and fixed all round the inside close in the angle formed by the flange and plate of the **T** iron is a frame of bridge or trough iron, which is secured to the plate and forms all round the frame a strong rectangular groove to receive *the bolt fastenings* which pass through the plate of another form

of T iron that constitutes the broad edge of the door. Other sections of double and triple angle-iron are employed for the door frames, and doors of double door safes, each having longitudinal angular recesses and projecting ribs, that mutually fit, the projection of one into the recess in the other, and vice versa, so that it is impossible to drive in a wedge, or spring the door-frame laterally.

The main door plate by preference is fixed to the inside of one of the side flanges of the T iron.

[Printed, 8d. Drawing.]

A.D. 1866, March 29.—Nº 911.

NOAKE, REUBEN.—The object of this invention relating to the manufacture of “iron safes and other strong boxes,” is so to secure and strengthen their bodies and outer frames as to render them burglar-proof. To this end it is proposed :—

1st. “To unite the adjacent edges of any two plates at right angles to each other by a wrought-iron angle piece, the section of which may be described as a square bar having two grooves or channels formed in it, one groove in each of the adjacent sides of the bar, in which are recessed the said plates to form the outer walls of the safe. Upon the inner angle of the bar, and rolled in one piece with it are two flanges at right angles to each other, to which the plates may be also rivetted, the exterior face of each flange forming a continuation of one side of the groove or channel before described. The said flanges viewed from the interior of the safe would have the appearance of ordinary angle irons and externally the square portions only of the angle pieces will be seen; these may have their corners rounded to improve their appearance. The bar will be rolled with the flanges upon it as already explained, but the grooves may be afterwards planed out of the metal. The bars are mitred together at each corner of the safe, and if desired may be assisted by an internal angular cover plate secured by rivets or screws. The side plates in addition to being rivetted to the flanges of the angle pieces may be assisted by tie bars if necessary.”

2nd. “To unite the edges of any two adjacent plates at right angles to each other by planing a dovetail groove in each plate. The said grooves will be inside the safe and a piece of

" angle iron which is to unite every two adjacent plates will have
 " a dovetailed projection formed upon the outside face of each of
 " its flanges corresponding to and being for the purpose of
 " entering into the said dovetail grooves in the plates. The
 " said plates may themselves be mitred at their edges and the
 " angle irons may if necessary be united at their points of junction
 " by internal angular cover plates secured by screws or
 " rivets."

[Printed, 8d. Drawing.]

A.D. 1866, March 31.—N^o 930.

HINDSHAW, GEORGE.—This invention relating to the construction of safes and similar depositories is designed with a view to prevent 1st. forcing open the doors by the introduction of wedges or levers inserted between the door and the door frame of a safe and, 2nd, as a protection to the hinges, which are disposed on bars which slide inside. To this end all the edges of the door or doors, viz., the top, bottom, and two sides, instead of being made straight are corrugated and have the form of a series of convex teeth, the interspaces being concave, and to the inner edges all round the door frame is given a corresponding form, so that when the door is closed there is no means of inserting the thin end of a flat wedge, which could not be driven in on account of the alterative curves. The hinges are secured to the bars, which are fitted to slide to and forth inside the safe between guides fixed against the sides.

When required to open the door it is first necessary after it is unfastened, to draw it forward clear of the door-frame before it can have liberty to turn back on its hinges. Anti-friction rollers are employed to facilitate the backward and forward movements of the door and sliding bars. The method of fastening is not described.

[Printed, 8d. Drawing.]

A.D. 1866, April 4.—N^o 954.

MADDOCKS, JOHN, and DUNN, WILLIAM.—(*Provisional protection only.*)—This invention relates to the construction of safes and similar depositories and consists in the "application
 " and use of 'dovetail' shaped bars to the interior surface of
 " the door of the safe, such bars entering and sliding in grooves of

“ corresponding shape formed in the top and bottom sides of the safe. In this arrangement hinges are dispensed with, the door being made to slide in the grooves, and if heavy may run upon small rollers in the grooves. When the door is closed the joints between the door and the sides of the safe by reason of their form are flame-proof and will resist the use of wedges or levers, and gunpowder cannot be introduced through the joint as hitherto. The bolts of the lock to secure the door pass through apertures in the sides of the grooves and enter recesses in the dovetail bars, which prevents the sliding movement and secures the door.”

[Printed, 4d. No Drawings.]

A.D. 1866, May 16.—N° 1387.

GISBORNE, JOHN SACHEVERELL.—The object of this invention relating to the protection of safes, is to give warning to the proprietors of or persons in charge of thief and fire-proof safes, boxes, strong-rooms and other similar depositories, whenever a safe is being tampered with, or any improper attempts are being made to open it; and the effect of such tampering or surreptitious attempt to open a safe is by the invention made the active means of its detection. The invention is described as follows, viz. :—

“ I construct the walls or other principal portions of a safe, or the door or more exposed portion or portions only, or the lock, bolt, bar, or other fastening, in two portions, say, inner and outer, and separate or insulate these the one from the other by any non-conductor of electricity. To the said separated portions I connect wires from a galvanic battery or magneto-electric generator of electricity placed in the safe or other secure position. When so connected the electric circuit is not complete; so soon, however, as the parts are brought into communication or contact by a key or ‘ picker ’ passed into the lock, a drill forced through the walls or other part, or by other means, the electric circuit will be established, and at this instant a signal, say, the ringing of a bell, will be given either in or at the safe, or at any desired distance therefrom. It will be obvious that, instead of the said interference, opening, or damage being the cause of establishing the electric circuit, it might be the means of breaking the circuit, and I purpose so *adjusting the wires and connections when advisable so to do.*”

“To show at what time a safe fitted as above, when once
 “locked or fastened, was opened or vice versa, I propose to
 “connect the electric conducting wires to the well-known re-
 “gistering apparatus consisting of clock work, revolving cylinder,
 “spaced web of paper and pencil, and when the circuit is
 “completed or broken, causing the pencil to make an indellible
 “mark.”

[Printed, 8d. Drawing.]

' A.D. 1866, May 16.—N° 1390.

PRICE, ELIHU, and PRICE, CYRUS.—The object of this inven-
 tion is principally to increase the resisting power or quality of
 safes, so as to defeat burglarious attempts to spring or force out
 the doors by crowbars or wedges.

To this end “the outer case is made as usual, except that we
 “drill or punch holes in those parts where the safe or door frame
 “may require extra strength, which is principally on the side
 “strips; if this extra strength is only required round the door
 “or doors, as is generally the case, the fireproof lining is next
 “placed in its position, and to this lining a door or doors is or are
 “hinged, which said door or doors has or have on the inner side
 “the fireproof chamber. This door or doors is set back a suffi-
 “cient distance to allow space for bars and an outer door or
 “doors; the fireproof lining being adjusted hooks or eyes are
 “rivetted or screwed into the holes which were left for the pur-
 “pose, and moveable tension or stretcher bars are adjusted to the
 “said eyes or hooks, so that should the sides, top or bottom be
 “strained outward the tension or strain will be on one or more of
 “the said bars; these bars may be made to lock, mortice, or
 “dovetail together, or be left plain, and may be horizontal,
 “perpendicular, or both, or in any suitable position; the inner
 “door or doors may have a lock or locks. The outer door or doors
 “is or are next fitted, to which is added a lock (and lock case),
 “but by preference no fireproof case. The lock on the outer
 “door may be made to lock or fasten to the moveable tension
 “bars; if the safe is required to be strengthened in other parts,
 “the eyes or hooks may be fixed in any convenient part and the
 “bars fitted and removed at will, so that the strength of the safe
 “can be increased to almost an unlimited extent simply by the
 “addition of moveable tension bars, which may be added as

“ occasion requires. These moveable bars may be applied to safes, iron doors, or strong-rooms in the manner before described; the fastening or connecting parts of the moveable tension bars may be of any convenient and known description.”

[Printed, 6d. Drawing.]

A.D. 1866, June 7.—N° 1570.

GRIVEL, ANTOINE, the younger.—This invention relates to the construction of drill-proof safes, strong rooms, and other similar depositories, and to the fastenings, which comprise two kinds, respectively opened, one by means of a key, and the other without. These lock fastenings and the system employed for bolting and arranging the bolts, are more particularly described in the series of Abridgements relating to “Locks, Latches, Bolts, and Similar Fastenings.”

The doors of safes and strong rooms are rendered drill-proof by a plate of hardened steel disposed either between the outer and the inner lining plate, or as an external covering. This steel plate is to have its surface roughened after the manner of a file, so that it may destroy the cutting edge of any drill or other instrument employed to perforate it. These prepared steel plates may, applied in the same manner, be employed to protect the surfaces generally of the safe body. Suitable recesses and rebates are made in the front part of the safe surrounding the door to receive and hold the fastening bolts when thrown or projected.

[Printed, 1s. 10d. Drawings.]

A.D. 1866, June 11.—N° 1587.

BAXTER, JOHN, and HUNT, JOHN.—(*Provisional protection only.*)—This invention relating to the construction of safes or receptacles for securing property consists in:—

1st. Casting the body of the safe comprising the two sides, top, bottom and back, in one piece of steel or other metal, instead of making it in several parts joined together. The door is also to be cast in the same manner.

2nd. “Making the joints of the door and the body of the safe or receptacle with V-shaped or toothed projections and recesses instead of straight as now customary, by which means the difficulty of introducing wedges for bursting open the safe is greatly increased.”

3rd. "Making a groove in the body of the safe or receptacle, and a corresponding projection on the lid, or vice versa, and in causing the bolts to pass into holes in the body of the safe or receptacle at both sides of the said projection."

[Printed, 4d. No Drawings.]

A.D. 1866, June 12.—N° 1598.

KURZ, FREDERICK WILLIAM.—(*Provisional protection only*).—This invention relates to the doors of safes and strong rooms, to which two doors are fitted to slide in grooves one behind the other, the interior of the safe being divided into two compartments, of which only one of them can be accessible at the same time. "By this arrangement the grooves in which the doors slide are carried round all four sides of the opening (that is, right, left, top and bottom), and there is no long slit or opening for the doors to slide out through, as they do not slide out beyond the safe but merely slide, one before or behind the other. This element of weakness being thus dispensed with, the safe or strong room is rendered much more secure, and the introduction of wedges or other tools for breaking open the same much more difficult. As a further protection I also propose to fill up the top or bottom groove (or both) in which the front door slides by means of a hinged bar which cannot be removed until the other door (which slides behind it) has been opened. I also fix a dovetail bar across the opening about midway between the top and bottom, on which bar a dovetail groove in the back of the sliding door fits. The doors when closed may be locked by means of any ordinary lock," but that which is described in the Provisional Specification which accompanies a petition for Letters Patent, No. 1597, also dated as above, is preferred.

[Printed, 4d. No Drawings.]

A.D. 1866, June 22.—N° 1671.

PEYTON, EDWARD.—This invention is designed to prevent the forcing open of safe doors by means of wedges driven in between the edges of the door and the sides of the safe or door-frame. It, as described by the inventor, consists in :—

"Applying to the safe in any suitable part, but by preference in the door, a second circular door, either smooth or serrated

“ on its edge, and fitting with the greatest accuracy an opening
“ large enough to admit a man’s arm, or larger if required. The
“ edge of this circular door is bevilled, so that the door assumes
“ the form of a short frustum of a cone, and its seating, into
“ which it may be ground to fit with the nicest accuracy, is also
“ bevilled. The outside angle of the edge of the door has a
“ slight fillet or bead extending over both the edge of the door
“ and the corresponding edge of the plate into which it fits, and
“ the hinge is made double jointed, and is fixed inside the door
“ plate, so that when closed the open edges are barely perceptible.
“ A lock is fitted in this circular door, and I prefer that it should
“ be constructed to throw its bolts radially into the door plate by
“ a key in the centre of the door.”

“ The object of the invention is this, to conceal the mode in
“ which the ordinary large safe door is to be opened, and by pro-
“ viding means for getting the hand, or if necessary the whole
“ arm, inside the door to render it possible to use bolts or bars
“ for securing the door of such strength and arranged in such a
“ manner as to preclude the possibility of forcing it open with
“ crowbars, even if the points should be forced between the door-
“ and the plate, and by hanging the large door also with double
“ jointed hinges from the inside, their action being thus concealed
“ from the outside, and making the edges to fit accurately, further
“ security may be ensured. I also propose to employ a circular
“ door made as above described, and without any second door if
“ preferred.”

[Printed, 4d. No Drawings.]

A.D. 1866, August 1.—N^o 1977.

BILLING, EDWIN ISAAC.—The object of this invention is to obtain “ great strength and security ” in the construction of safes, and the mode of fastening employed. The form of these safes is by preference spherical, comprising “ two hollow spheres, one “ smaller than the other, the smaller one being situated concentrically within the larger one, and capable of rotating or partly “ rotating therein. The smaller hollow sphere has two pivots or “ centres which turn in bearings in the outer hollow sphere. “ Each of the hollow spheres has an opening and door of a “ circular form, the said doors being connected with their respective “ spheres by screwing, or by means of an arm jointed at one end

“ to the sphere, and at the other end to the door. By this
“ arrangement the door of the outer sphere can be turned aside,
“ and the door of the inner sphere opened and withdrawn at the
“ opening of the outer sphere. The edges of these doors and
“ openings in the spheres in which they fit are cylindrical, either
“ plain or screwed. By adopting this shape great obstruction is
“ offered to the successful use of wedges. The doors when closed
“ complete the spherical figures of the outer and inner spheres
“ and are fastened by locks which simultaneously shoot four
“ bolts at right angles to each other. These bolts are shot against
“ the inner surface of the spheres respectively, or into recesses or
“ staples in the edges of the openings in the spheres. The outer
“ sphere, or both the outer and inner spheres, may be provided
“ with a lining or casing, the space between which and the sphere
“ may be filled with any of the ordinary fire-proof compositions.
“ By means of the rotary motion which the inner sphere is capable
“ of within the outer sphere, the door of the inner sphere may be
“ turned from opposite that of the outer sphere. I prefer to give
“ the necessary motion to the inner sphere by bevil gearing worked
“ by an axis, so as to bring the door of the said inner sphere
“ opposite that of the outer sphere, or to remove it therefrom ; or
“ the requisite motion of the inner sphere may be effected by the
“ locking and unlocking of the door of the outer sphere. Although
“ I prefer to make the inner and outer shells or parts of the safe
“ of a spherical figure, yet I do not limit myself thereto, as other
“ forms may be adopted with nearly the same effect. For example,
“ a spheroidal or cylindrical figure may be given to the two shells
“ or parts of the safe without interfering with the facility with
“ which the inner one may rotate in the outer one, or without
“ materially affecting the strength of the safe. I prefer to make
“ the inner and outer parts or shells of the safe of cast or wrought
“ iron.”

[Printed, 8d. Drawing.]

A.D. 1866, August 2.—N° 1993.

CHILLCOTT, ISAAC ELDON.—(*Provisional protection only.*)—
This invention, relating to safes, strong-rooms, and similar depositories, is designed to prevent their being burglariously forced open by steel wedges driven in between the edge of the door and the door jamb or frame.

The inventor says, "In carrying out my invention I make the sides of the door (or lid) serrated, and I make corresponding serrations or indentations on the jamb (or in the side of the box), so that when the door (or lid) is closed, these serrations or indentations interlock with each other, and the interstices between the edges of the door (or lid) and the jamb (or the side of the box) represent a waved or zig-zag line instead of a right line as heretofore."

"It will be evident that the waved or zig-zag form of the interstice or line of junction will effectually prevent the introduction of wedges therein, and thus afford an increased safety or security against such safes, strong-rooms, or other similar depositories being burglariously forced open."

[Printed, 4d. No Drawings.]

A.D. 1866, August 22.—N° 2152.

MINNS, HENRY ROYALL.—This invention relates to the construction of the door frames of fire-resisting and thief-proof safes, to the fire-resisting compound employed, and to the mode of securing the doors by means of revolving hooked bolts, or plates actuated simultaneously by a central handle, and detained in position when thrown by the bolt of a small lock. The front inside edge of the door-frame is rebated to receive the edge of the door plate for the purpose of forming a lap joint, in order to prevent the insertion of wedges if attempts be made to force out the sides.

The combination or preparation of the fire-resisting materials employed to fill the cavity between the inner and outer casings of safes, consists of sawdust steeped in a solution of alum and sugar of lead, the relative proportions of the substances in a dry state being, 3 lbs. of alum, 6 ozs. of sugar of lead, and one bushel of sawdust. Instead of dissolving the salts, they may be reduced to a powder and mixed with the sawdust in that state.

[Printed, 1s. Drawing.]

A.D. 1866, September 3.—N° 2256.

HOSKING, ALBERT WHITFORD.—This is an invention of a detecting apparatus designed for the protection of safes, and consists in establishing a communication between the safe and a signal light, which may be placed conspicuously outside the build-

ing, in the window or front part of a shop, warehouse, office, or other premises wherein the safe is used, the object being to give visible indications by means of such light, that will represent by its condition at all hours the state of the safe. "This is effected " by means of a lamp having two bull's-eyes; behind such " bull's-eye an ordinary gas burner is placed. The existence of " these lights indicates the security of the safe, and contrarily, " the extinction of the lights will constitute a signal of danger. " That portion of the apparatus which is to extinguish the light " or allow it to burn is placed within the safe, and is of the " simplest character, occupies so little space that the ordinary " arrangements of a safe are not interfered with; it consists of a " spring placed within a tube passing through the bottom of the " safe, and having direct communication with the lamp by a band " or chain, which passing around a gas tap within the lamp, " causes, on the release of the spring in the safe, the instant " extinction of the two lights, followed immediately by a pro- " longed glare of magnesium light obtained by use of Larkin's " magnesium powder, which is ignited by a third and inde- " pendent jet of gas. The band or chain communicator is " conveyed through a glass tube which is itself enclosed within " the iron gas tube supplying the burners within the lamp, so " that any attempt to disarrange the apparatus would but pre- " cipitate discovery by the breaking of the glass tube and the " consequent escape of the gas through it."

[Printed, 8d. Drawing.]

A.D. 1866, November 3.—N^o 2856.

CHUBB, JOHN, and CHALK, WILLIAM HENRY.—This invention relates to the construction of the door-frames of safes and strong rooms, and to the main fastening bolts which, by suitable devices actuated by the central knob or handle, are caused to diverge simultaneously in opposite, inclining, or diagonal directions, and engage in corresponding recesses formed in bridge-iron, which constitutes the inner section of the door-frame. This part of the invention is more particularly described in the series of Abridgments, entitled "Locks, Latches, Bolts, and " similar Fastenings."

The object of the invention as regards the construction of the door-frames, is to obtain increased strength and greater holding

power. Two methods of construction are devised for this purpose. The first consists in fixing internally all round the door-frame, a strong bar or rail of bridge-iron, against one side of which the door-plate closes, and into which through suitable openings the ends of the fastening bolts are thrown. According to the second arrangement, the door-frame is constructed of strong L angle-iron, the broad flange or plate of which is fixed round inside the front of the safe, the inside of the narrow flange being undercut to receive the front slanting edge of the plates which form the top, bottom, and sides, the outer surface of the narrow flange thereby forming the front of the door-frame, and the external angle of the L iron being rebated, receives the edge of the door. "This arrangement is peculiarly applicable in constructing strong door-frames for iron safes where each side or end panel is composed of several thicknesses of iron or steel. . . . The steel plates of all four sides are rivetted and screwed to the frame, and their edges are inclined, and housed under corresponding inclines."

[Printed, 10d. Drawing.]

A.D. 1866, November 7.—N° 2894.

GOODBRAND, WALTER and HOLLAND, THOMAS ECCLES.—This invention relating to the protection of safes, is designed for the purpose of giving visible indications that burglarious attempts are being made to open them, and also for giving an audible signal or intimation of the same to watchmen or others in charge, the first effect being accomplished mechanically by extinguishing a gas light, and the alarm signal by the ringing of a bell by means of electricity.

"The apparatus is secured within the safe or depository, and consists of a chamber which is supplied with gas from outside the safe, and a glass tube through which the gas passes to a lamp or jet situated outside the building, or in the street, or other conspicuous position; a metal pipe inclosing the glass tube also is connected to this chamber, the other end of which pipe is open to the atmosphere. The gas is prevented from passing into the atmosphere through the metal pipe by means of a valve which is mounted on a spindle or rod, the upper end of which is bent and retained in its position by hooking or *ledging on a hinged rod* secured to the opposite side of the safe.

“ which rod is also connected with a piston and rod enclosed in a
 “ box, and as long as the apparatus is in this position the gas
 “ will burn in the lamp ; if, however, any attempt be made to
 “ force open the safe by wedges, levers, or other means that will
 “ dislodge the hook or ledge and release the valve, it becomes
 “ forced by a spring over the glass tube aperture and extinguishes
 “ the light and leaves the other aperture and the gas open to the
 “ atmosphere, and at the same time the other end of the valve
 “ rod in falling completes an electrical circuit from a battery in
 “ the safe (or elsewhere), and causes a bell to ring above the lamp
 “ (or elsewhere) for any duration of time which may be determined
 “ by any well-known arrangement of spring and clockwork.”

[Printed, 8d. Drawing.]

A.D. 1866, November 22.—N^o 3064.

NICHOLSON, JAMES.—(*Provisional protection only.*)—“ This
 “ invention is designed for the purpose of rendering safes or
 “ other depositories for valuable articles more secure from bur-
 “ glarious attempts than hitherto, and the improvements consist
 “ in the novel manufacture, construction, and arrangement of
 “ the safe door, which is formed so as to overlap and cover the
 “ edges of the safe upon which the door or doors are closed, that
 “ is to say, the sides of the door or doors are made so as to cover
 “ the whole surface or front of the safe from the hinges to the
 “ outer edges, the sides or extremities of which are provided with
 “ projecting pieces which overlap and enclose the side and top
 “ and bottom plates of the safe.”

In the diagram which accompanies this specification the body of
 the safe is shown imbedded in the wall, and the front door plate
 covers the whole surface including the door-frame, excepting on
 the hinged side.

[Printed, 6d. Drawing.]

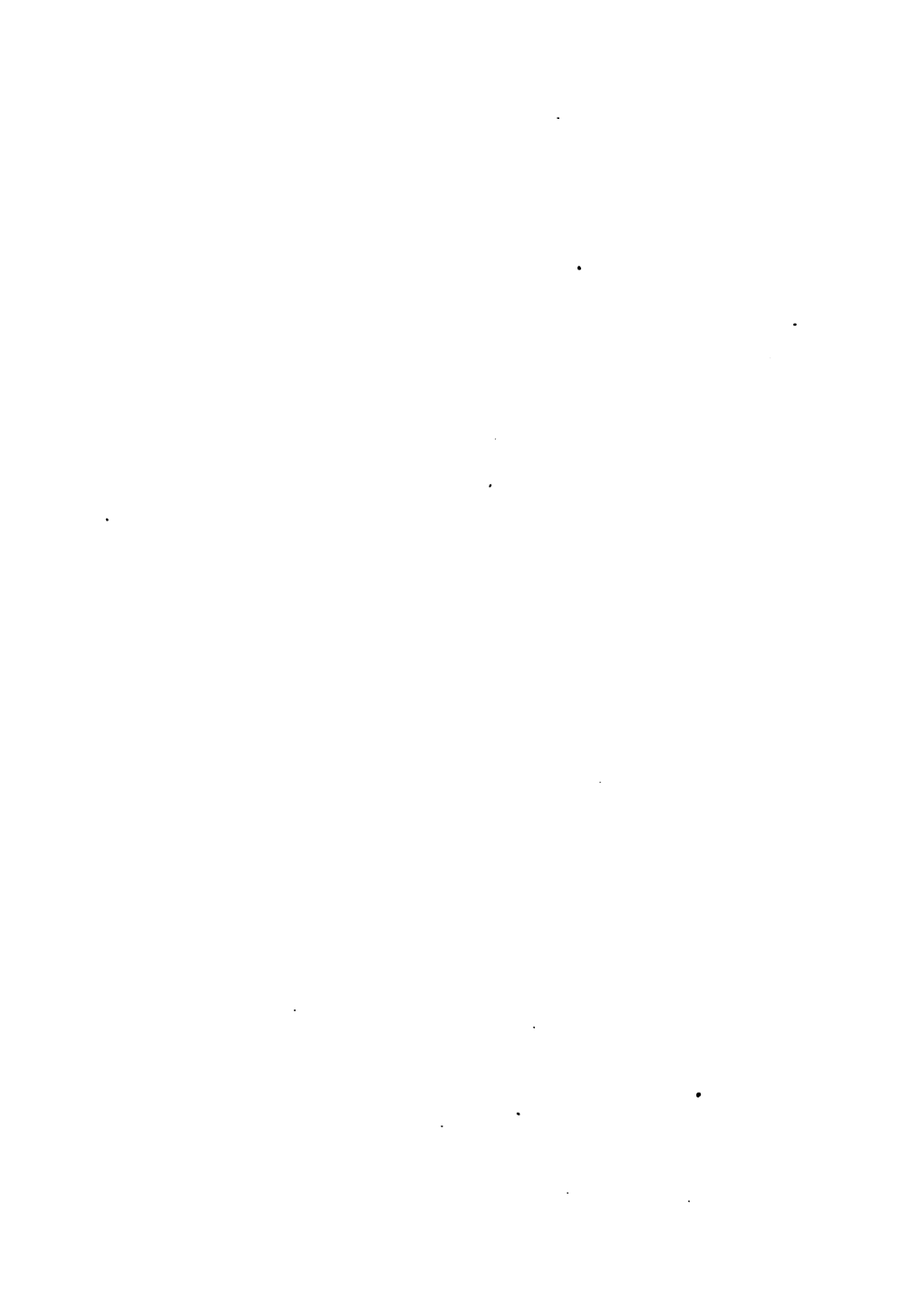
A.D. 1866, December 12.—N^o 3265.

CHATWOOD, SAMUEL.—The object of this invention relating
 to the construction of safes and key boxes is (as regards safes) to
 secure the door more effectually, so as to render such safes capable
 of resisting heavy strains. To this end at intervals round the
internal margin of the door is fixed, projecting inwards when the
door is closed, a number of studs with heads which pass through

corresponding holes or slots in the front part of the safe or door-frame, and are held by sliding plates or bolts. Modifications of this part of the invention are also described.

Boxes for the protection of keys are made of steel or partially converted iron in form cylindrical with wood linings and one end closed. The open end is covered in by means of a plug. The periphery of this plug is screw threaded to engage with screw threads cut inside the open end of the cylindrical box. The plug contains a small lock which, when the plug is screwed home, shoots its bolt into a recess made in the solid metal which surrounds the open end.

[Printed, 1s. 4d. Drawings.]



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2. A Treatise of Metallica, but not that which was published by Mr. Simon Sturtevant, upon his Patent, &c. By JOHN ROVENZON. (*Letters Patent granted A.D. 1612.*) Price 4*s.*; by post, 4½*d.*
3. A Commission directed to Sir Richard Wynne and others to inquire upon oath whether NICHOLAS PAGW or Sir NICHOLAS HALSE was the first inventor of certain kilnes for the drying of malt, &c. &c. (*Letters Patent, Nos. 33 and 85, respectively dated 8th April 1628, and 23rd July 1635.*) Price 2*d.*; by post, 2½*d.*
4. DUD DUDLEY's Metallum Martis; or iron made with pit-coale, sea-coale, &c. (*Letters Patent, Nos. 18 and 117, respectively dated 22nd February 1620, and 2nd May 1633.*) Price 8*d.*; by post, 8½*d.*
5. Description of the nature and working of the Patent Waterscoop Wheels invented by WILLIAM WHEELER, as compared with the raising wheels now in common use. By J. B. W. Translated from the Dutch by Dr. Tolhausen. (*Letters Patent, No. 127, dated 24th June 1642.*) Price 2*s.*; by post, 2*s.* 1½*d.*
6. An exact and true definition of the stupendous Water-commanding Engine invented by the Right Honourable (and deservedly to be praised and admired) EDWARD SOMERSET, Lord Marquis of WORCESTER, &c. &c. (*Stat. 15 Car. II. c. 12. A.D. 1663.*) Price 4*s.*; by post, 4½*d.*
7. Navigation improved; or the art of rowing ships of all rates in calms with a more easy, swift, and steady motion than oars can. By THOMAS SAVERY. (*Letters Patent, No. 341, dated 10th January 1696.*) Price 1*s.*; by post, 1*s.* 0½*d.*
8. The Miner's Friend; or an engine to raise water by fire, described, &c. By THOMAS SAVERY. (*Letters Patent, No. 356, dated 25th July 1698, and Stat. 10 & 11 Will. III. No. 61, A.D. 1699.*) Price 1*s.*; by post, 1*s.* 1*d.*
9. Specimina Ichnographica; or a brief narrative of several new inventions and experiments, particularly the navigating a ship in a calm, &c. By JOHN ALLEN, M.D. (*Letters Patent, No. 613, dated 7th August 1729.*) Price 8*s.*; by post, 9*d.*
10. A description and draught of a new-invented Machine for carrying vessels or ships out of or into any harbour, port, or river against wind and tide, or in a calm, &c. By JONATHAN HULLS. (*Letters Patent, No. 556, dated 31st December 1736.*) Price 8*s.*; by post, 9*d.*
11. An historical account of a new method for extracting the foul air out of ships, &c., with the description and draught of the machines by which it is performed, &c. By SAMUEL SUTTON, the Inventor. To which are annexed two relations given thereof to the Royal Society by Dr. Mead and Mr. Watson. (*Letters Patent, No. 602, dated 16th March 1744.*) Price 1*s.*; by post, 1*s.* 1*d.*
12. The letter of Master WILLIAM DRUMMOND for the construction of machines, weapons, and engines of war for attack or defence by land or sea, &c. Dated the 29th September 1626. (*Scotch Patent, temp. Car. II.*) Price 4*s.*; by post, 4½*d.*
13. Contributions to the History of the Steam Engine, being two deeds relating to the erection by Messrs. Boulton and Watt of steam engines on the United Mines at Gwennap, Cornwall, and at Werneth Colliery, near Oldham, Lancashire. From the originals in the Patent Office Library. Price 10*s.*; by post, 10½*d.*

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If any Patentee should be desirous of exhibiting a model of his invention in London, he may avail himself of this Museum, which has been visited since its opening on the 22nd June 1857 by more than 3,158,000 persons. The model will be received either as a gift or loan; if deposited as a loan, it will be returned on demand. Before sending a model it is requested that the size and description of it shall first be given to the Superintendent of the Patent Office Museum.

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All communications relating to the Patent Office, or to the Museum and Portrait Gallery, to be addressed to B. WOODCROFT, Clerk to the Commissioners of Patents and Superintendent of the Patent Office Museum, at the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.





